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Northern California's Computer Magazine

February 18, 1991 • 79

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Computer Crime

An Interview With Computer Security Expert Dorothy Denning

By John Perry Barlow

"Computers are used to support life-critical operations, such as traffic control and medical systems. Businesses rely on them. So there's a much greater concern about their correct use, their responsible use, than there was before."

Story begins on page 40

Perspectives On Crime, Security, And Ethics

MITCH KAPOR:

"My colleagues have heard about the terrible problems caused by hackers who break into computer systems, they worry that I'm out to defend such practices, and they disapprove." Page 26

CLIFF STOLL:

"This paranoia of people breaking into computers and stealing somebody else's information causes lots of extra locks, keys and passwords that make our systems even less easy to use." Page 53

JIM WARREN:

"The vast majority of computer criminals are insiders making use of their authorized access, and the vast majority of financial loss due to computer crime occurs in this context." Page 32

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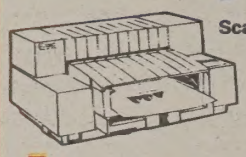

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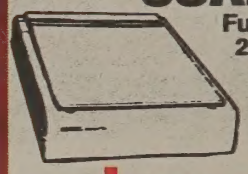

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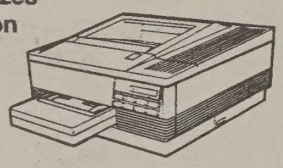

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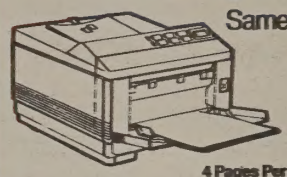

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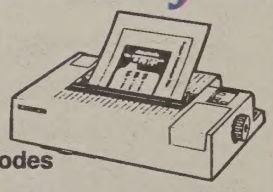

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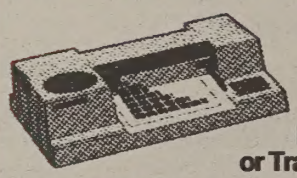

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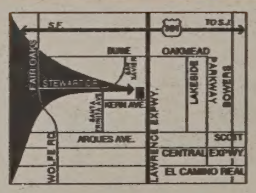

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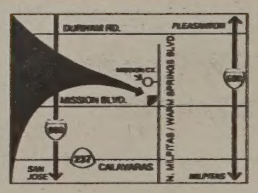

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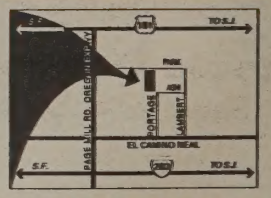

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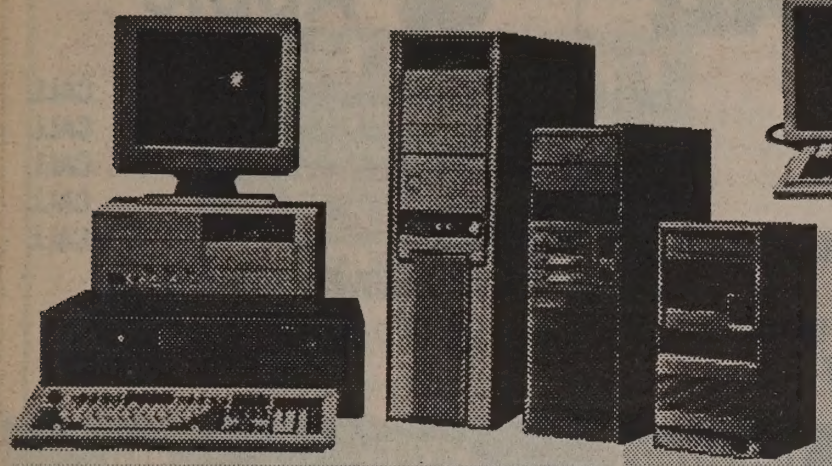

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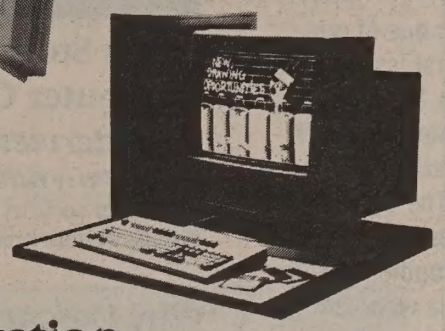

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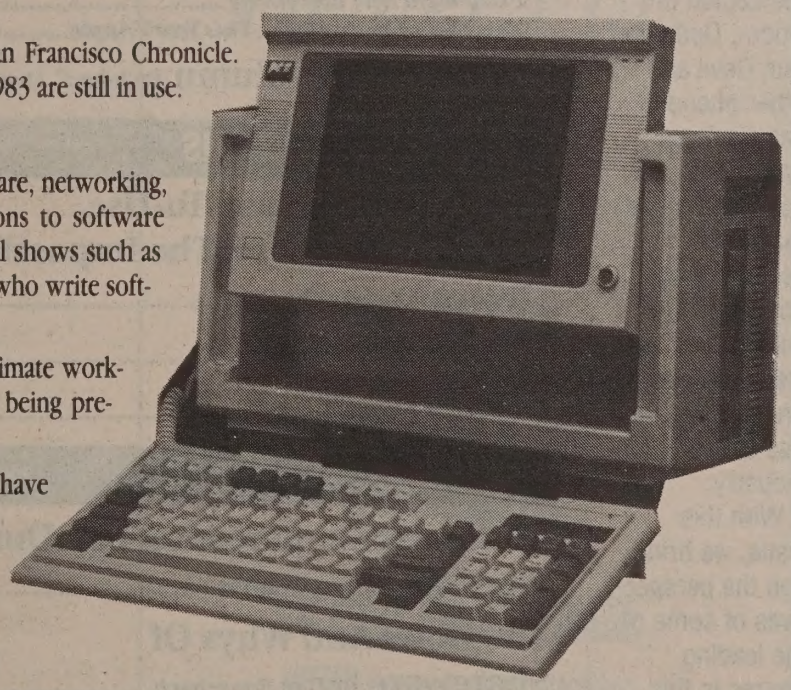

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MICROTIMES™

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A NOTE FROM THE EDITORS:

In one of our first issues back in 1984, we interviewed Bill Landreth, aka "The Cracker," a teenager from Southern California who had achieved a certain notoriety by breaking into computer systems and attracting the attention of the FBI.

Since that time, computer crime of various sorts has become front-page (and often none too accurate) news, with Robert Morris's Internet worm, the Legion of Doom, Operation Sun Devil and other phenomena (real and imagined) spawning a lively market in security products and consulting fees, as well as some pretty acrimonious debate in the industry.

With this issue, we bring you the perspectives of some of the leading figures in this debate, in hopes of provoking some thought and leading to a computing environment in which we can all comfortably coexist.

—*ME*

PERSPECTIVES ON COMPUTER SECURITY

Cover Story

Computer Crime: Beyond The Headlines 40
An Interview With Dorothy Denning
By John Perry Barlow • **Cover and contents photos: Susana Millman**
Computer security expert Denning and self-proclaimed cognitive dissident Barlow discuss system break-ins, hacker culture, recent court cases, and long-term issues.

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Lotus founder and Electronic Frontier Foundation chairman Kapor explains what the fledgling EFF organization is up to, and why.

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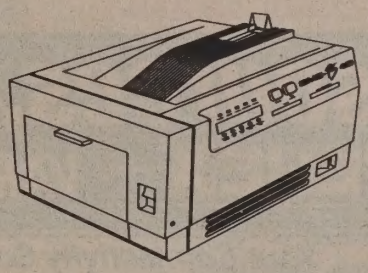

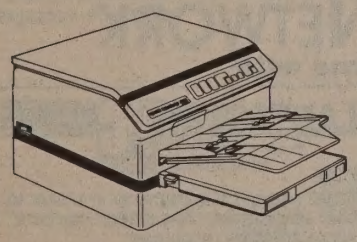

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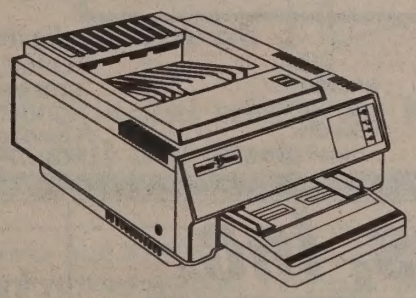

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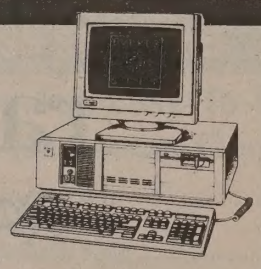

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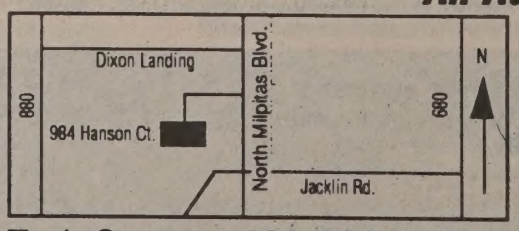

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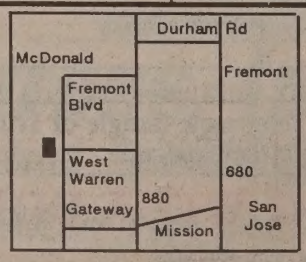

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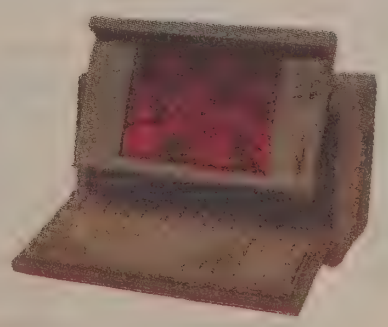

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INDUSTRY INSIGHT

BY PAUL HOFFMAN

APPLE IN 1991 NEW IMAGE, NEW REALITY

The beginning of the year has traditionally been a good time for Apple. The Macworld Expo in San Francisco generates lots of publicity for new Macintosh products and gives Apple a chance to counter the late-year IBM publicity from shows like COMDEX.

As in years past, Apple announced new machines in early fall last year and is now seeing the results of its marketing push: incredible response for its low-end, a few more markets, but less general excitement about the Macintosh.

Part of this lower excitement, of course, is due to Microsoft Windows 3 stealing the Macintosh's thunder. With Windows applications that compete with Mac applications coming out at a steady pace, current PC users have less reason to switch to Macintosh for specific programs. People who don't actually run Windows can now easily say, "See, the PC can act just like a Macintosh," and feel less worried that someone will force them to go Apple.

Another factor in the lowered excitement level is that no new categories of software have come to the Macintosh first recently.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

THE REVOLUTION IS OVER

By most accounts, this year's Macworld Expo was the least exciting one yet. There were almost no new products announced, just "exciting" upgrades. Even so, most booth staff reported that the people attending the show were more serious, knew more about what they wanted, and were more discerning about what they wanted to buy. To the great dismay of many companies, many users also reported that they were willing to forego the current round of upgrades of products that they had been using.

Apple's Ethernet: Apple's central booth had lots of gee-whiz technology but almost nothing new. (Why is it that IBM's booth at every major trade show looks like a morgue with display consoles?) Earlier in the week, Apple had announced its new modular Ethernet system that will help gain a foothold in many corporate markets. Although there have been many Ethernet cards for the Mac for many years, Apple's system has the appeal of being able to run with many different types of Ethernet wiring. Since Apple is coming into the game so late, it cannot assume that potential clients will not already have wired their offices. The card has a generic connector on the outside; you connect a transceiver for the type of cabling you use to the card to hook it to your system.

The two-part Ethernet system has some fairly strong advantages over other Macintosh or PC systems. It allows companies with more than one type of cabling to use the same card in all of their Macs. It also allows third-party vendors to come up with better or cheaper transceivers, or tranceivers for cabling systems that didn't catch on but still have sites. The list price of the Ethernet card is $425 for Mac IIs (and $200 for the new IILC), plus $175 for the tranceiver. Thus, the system lists about 30% more than equivalent PC systems but that price difference may be made up in cheaper software.

Other Announcements: Other than the new Ethernet system, there wasn't much special happening around the show. Farallon announced that it had taken over Apple's PC LocalTalk boards and software. It was making improvements to the AppleShare PC software to make it more compatible with Windows 3 (something that Apple had not done) and was selling the board, software,

Most booth staff at Macworld Expo reported that the people attending the show were more serious, knew more about what they wanted, and were more discerning about what they wanted to buy.

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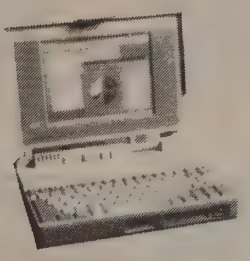

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Although the LocalTalk system is much slower than Ethernet cards of about the same price, the $300 price tag includes software that takes up much less RAM than standard PC network operating systems and needs much less system administration.

The new version that got the most attention was Microsoft's announcement of Excel version 3 the week before the show. Although the Windows version was shipping at the announcement, the Macintosh version will not ship for a few months. The new version includes features usually only found in word processors: outlining features and style sheets. With outlining, Excel can turn a worksheet with levels of sums into a multi-level outline. It is then easy to hide and show the different levels. The style sheet capability makes formatting spreadsheets much more consistent. In fact, Excel can automatically add styles to a spreadsheet based on examples, making formatting almost automatic.

Although fonts seem almost passé these days, music and sound are still going strong. Among the few new products was a pair of music notation fonts, GraceNotes and Crescendo from Casady & Greene. The fonts were designed by Wendy Carlos, famous for her recording of *Switched On Bach* and the music for films such as *Tron* and *Clockwork Orange*. She included all standard musical symbols, as well as modern music symbols, percussion symbols, symbols for particular instruments such as organs and harps, and even Gregorian chants.

It was clear that Apple was selling many more computers in pairs. Whereas previously these double sales were going to clones—an 80386 VGA system for one person and an 80286 monochrome system for the other (usually a secretary or assistant)—people could now afford to buy a IIsi or an LC and a Classic.

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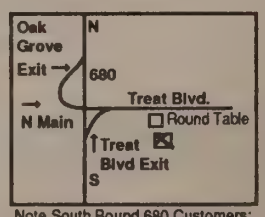

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LANDMARK=16
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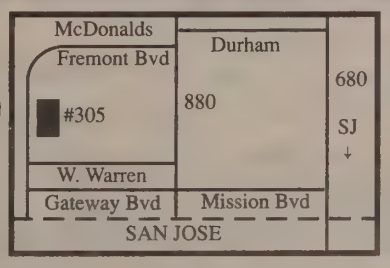

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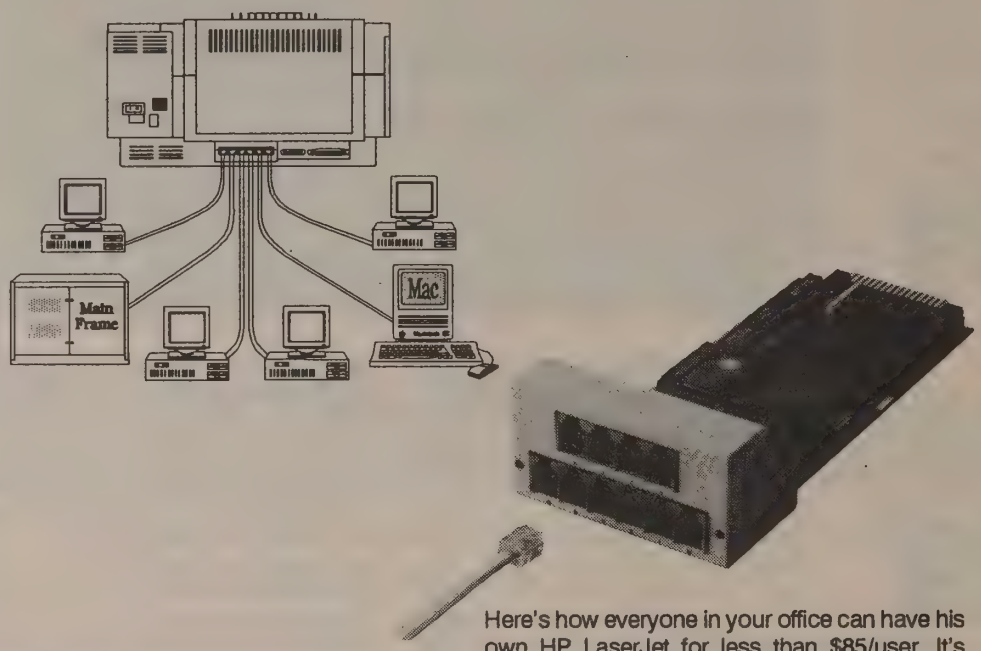

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report issued after the show indicates that things are incredibly good, even though we're going into a recession and a war. Revenues rose 12% over the comparable quarter a year ago, and profits were up 21% over the same period. The stated reason: the Macintosh Classic.

Apple has had such a high demand for its lowest-cost computer that it can't keep up with orders. The new low end has taken it by surprise. Not that the rest of the Macintosh line is doing badly, but there was more of a pent-up demand for the low-cost Mac than anyone suspected. Apple is selling 50% more computers than it was a year ago.

Who is buying these computers and why was even Apple surprised? When I talked to people at the Macworld Expo, it was clear that Apple was selling many more computers in pairs: one to a higher-ranking person, one to a lower-ranking one. Whereas previously these double sales were going to clones—an 80386 VGA system for one person and an 80286 monochrome system for the other (usually a secretary or assistant)—people could now afford to buy a IIsi or an LC and a Classic. It was a good sign that many people buying from stores at the show were buying two copies of a program at once instead of buying a single copy and using it illegitimately on the second computer.

What seems strange to many people is how Apple could garner this much interest so soon after Microsoft released Windows, the supposed Mac-killer. Microsoft says that it's shipped over two million copies of Windows in the last six months, although it certainly won't reveal how many of those are actually being used. Sales numbers for Windows applications indicate not as many as one would hope. It is likely, then, that many people who tried Windows on their current hardware were disillusioned and, instead of buying up in the PC chain, saw the Classic as a way to switch over to the Macintosh.

The people at Insignia, who sell a low-cost PC emulator for the Macintosh and are supported by Apple by being a part of every government bid it makes, were quite busy with first-time lookers. These are probably people with one or two PC programs that they didn't want to part with when they came over to Apple.

Looking at the American market can be very deceptive. Windows has not penetrated nearly as well around the world as it has in the US. Most people forget how heavily Apple relies on the rest of the world for its revenue. A year ago, Apple's international

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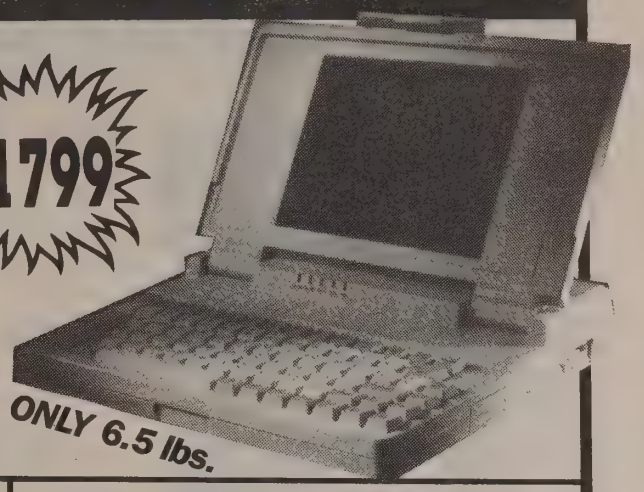

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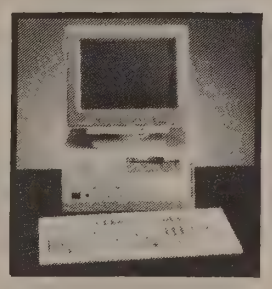

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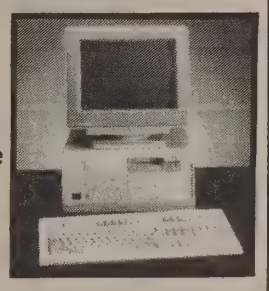

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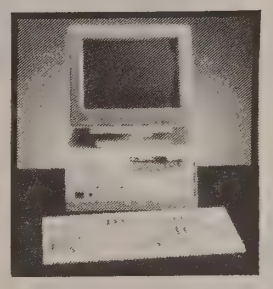

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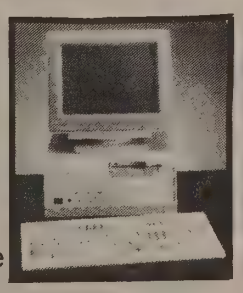

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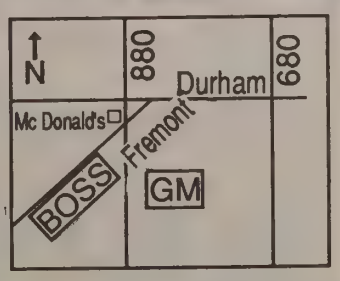

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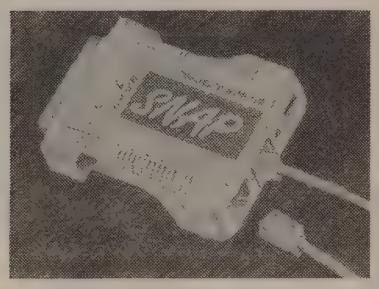
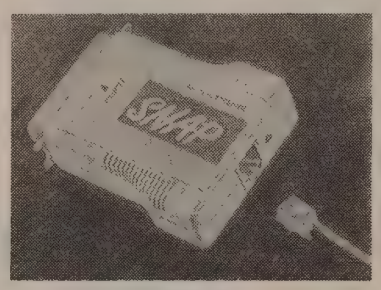


SNAP transmitter - $49



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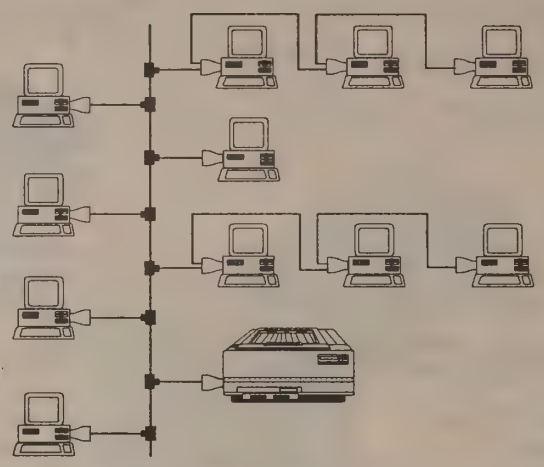

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sales accounted for 36% of its revenue; this year it's up to a whopping 45%. Part of that can be attributed to the ever-weakening dollar and Apple's overseas manufacturing. A larger part, however, is probably due to Apple's improving image overseas.

Instead of being a bunch of upstarts who bucked the trend of Microsoft, Apple's international image is that of a provider of novel solutions to real problems. Apple has made available international versions of its system software almost immediately after its US counterpart. It offers dozens of keyboards, each specialized to the country in which it is sold. Translating applications on the Macintosh is much simpler and more consistent than it is on any other computer.

THIS YEAR'S ENVIRONMENT, THIS YEAR'S APPLE

Apple is still flush with cash, has a solid user base, and is still a very flexible company. The recession is already starting to hurt many computer companies, and every week there is news of massive layoffs at major vendors like 3Com, DEC, and Informix. Many economists expect the recession to be harder on the US than on other countries because the dollar is already so weak and because of our pitifully small savings rate. This can work to Apple's advantage, due to its heavy amount of international revenues.

Apple certainly isn't assured of an easy time, however. A major problem is that its computers are still quite expensive relative to PC clones. As money tightens, it is likely that buyers will shy away from expensive manufacturers such as Apple, IBM, and Compaq in favor of cheaper no-name brands. They also may stop buying PCs altogether, waiting for better times. In the past thirty years, the predictions of how long recessions would last have been correct a random amount of the time, so no one knows how long buyers might wait before purchasing expensive goods again.

Apple's decision to pull Claris back into the corporate fold may have been a good defensive move, since general office software will probably do fairly well even in a recession. If times get very grim, as some economists predict, Apple can shift more people towards the Claris end of things, and Claris can start making more of an effort to sell its wares in the international market.

American Macintosh software companies are not selling nearly as much in the international market as Apple is, despite Apple's strong push with its developers to do so. Instead, many small software compa-

Continued on page 182

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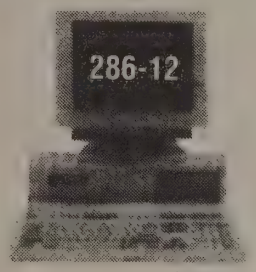

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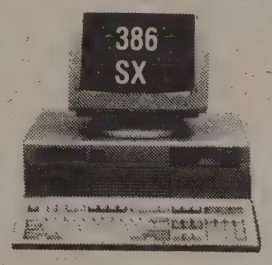

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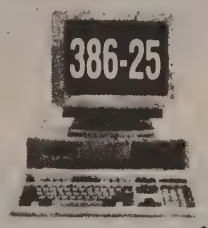

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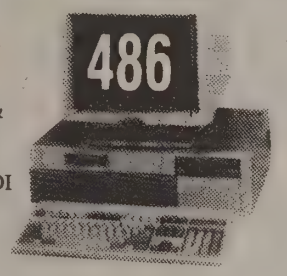

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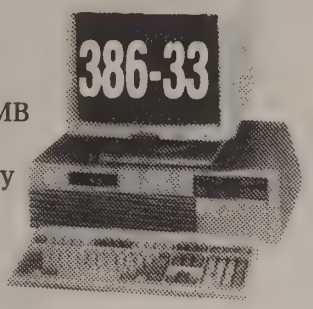

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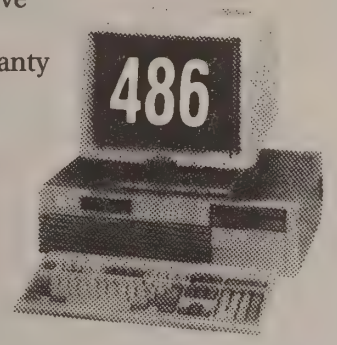

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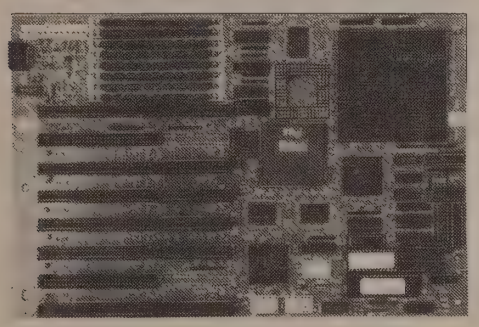

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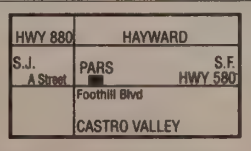

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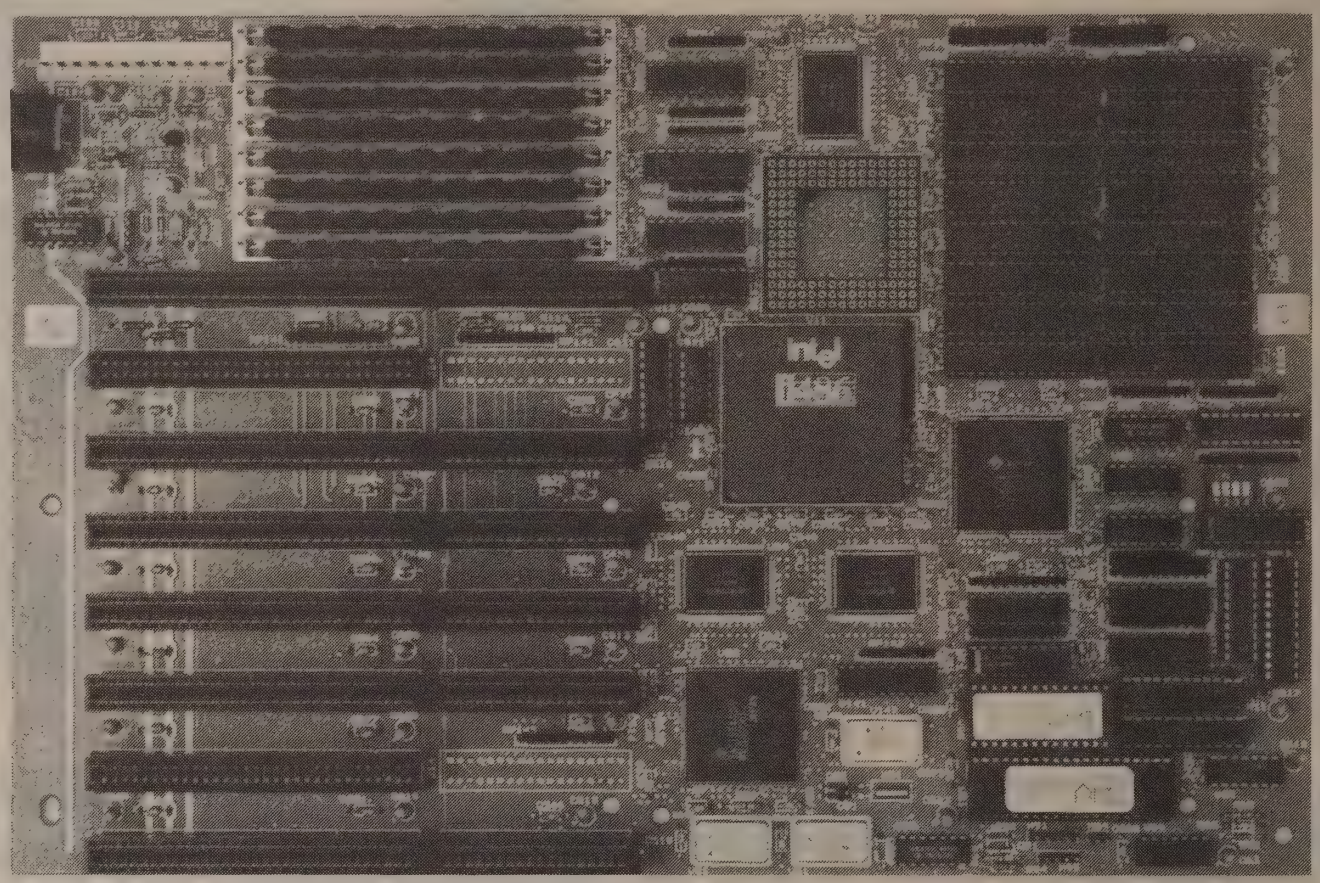

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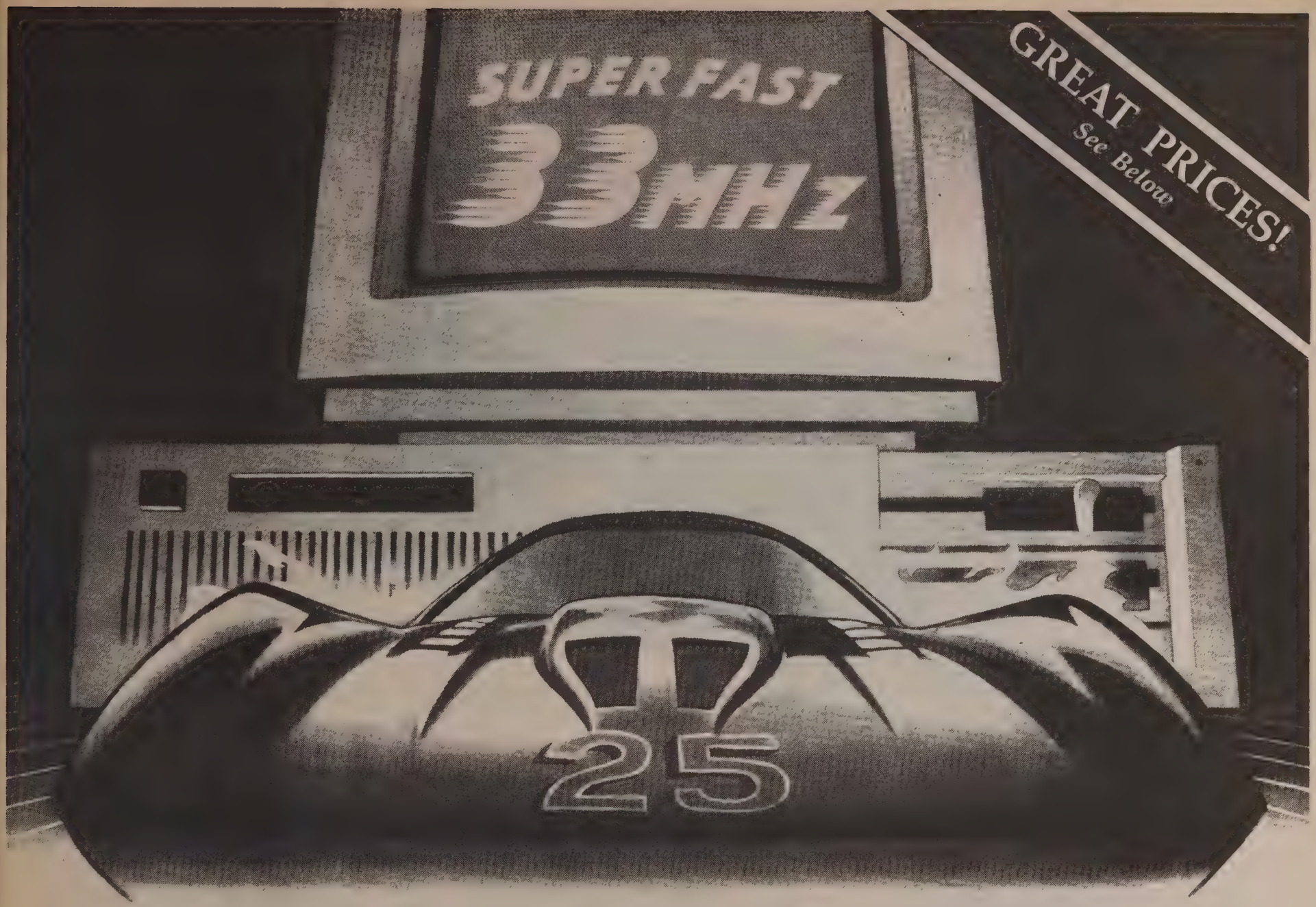

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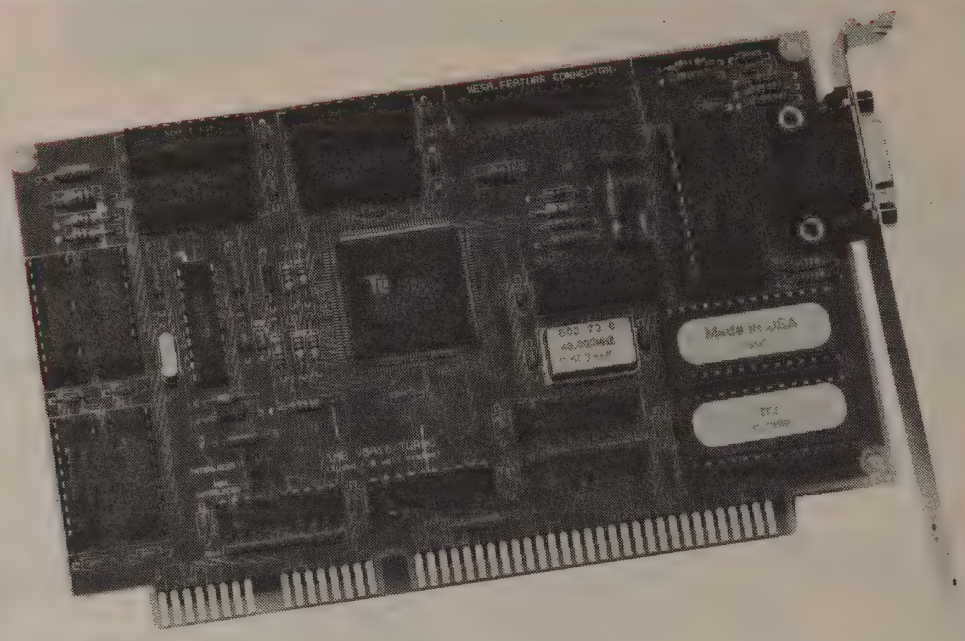

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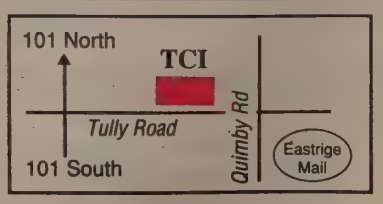

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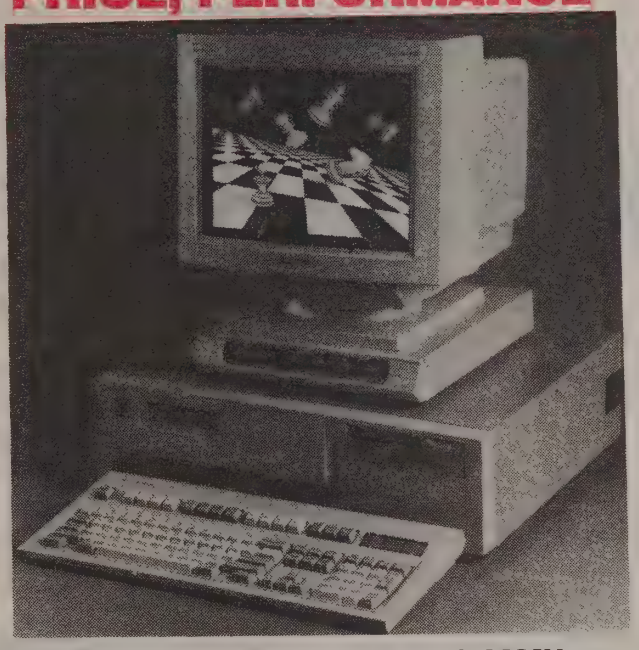

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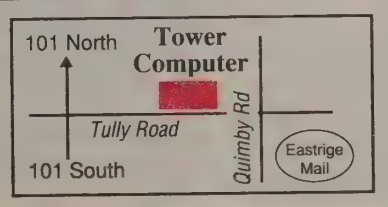

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Why Defend Hackers?

There's More To This Than Computer Break-ins

BY MITCH KAPOR

GUEST EDITORIAL

An all-too-common perception of the Electronic Frontier Foundation that prevails in the computer industry and among those who report on it—from John Sculley to the *Wall Street Journal*—is that the EFF is an organization that has "something to do with hackers." (They use "hackers" as a term not of approbation but of rebuke.)

Most of these sometime colleagues and associates of mine are puzzled as to why I would be doing such a thing. (A few think I've just become a loony.) Anyway, they've heard about the terrible problems caused by hackers who break into computer systems, they worry that I'm out to defend such practices, and they disapprove.

But their disapproval is based on the pure misconception that the EFF's purpose is to defend people's right to break into computer systems. Let me clear up that misconception now.

I regard unauthorized entry into computer systems as wrong and deserving of punishment. People who break into computer systems and cause harm should be held accountable for their actions. We need to make appropriate distinctions in the legal code among various forms of computer crime based on such factors as intent and the degree of actual damage. In fact, the EFF has drafted a bill that has the backing of the Governor and Attorney General of Massachusetts and that embodies these principles.

But if the EFF isn't trying to advance the cause of computer hackers, you may ask, what is it doing and why? What is it that was sufficiently powerful to motivate me to help start a whole organization?

CASE HISTORIES

As I began to find out the real story behind government raids and indictments last summer, I became incensed at the fact that innocent individuals were getting caught up in the blundering machinations of certain law enforcement agencies and large corporations. These were kids really, young people with whom I identified, who faced the prospect of having their lives ruined.

Take Craig Neidorf, for example. Neidorf, a 20-year-old college student and the publisher of *PHRACK*, an electronic newsletter, was indicted on felony charges of wire fraud and interstate transportation of stolen property. Neidorf had published a document about administrative procedures used in the 911 emergency response telephone system, which someone else had removed from a BellSouth computer. On the fourth day of the trial, the prosecution dropped the case after it became clear that the information in the "highly confidential" BellSouth document at issue was publicly available for less than $20.

Justice was served by the government's decision to drop the case, but it was expensive justice. Neidorf and his family face $100,000 in legal bills, to say nothing of the disruption and suffering caused by the trial for an action that should never have been brought against him to begin with. And the prosecution has had a chilling effect on Neidorf, who has stopped publishing *PHRACK*.

In a second case, the EFF continues to assist Steve Jackson, a game manufacturer in Austin, Texas, who suffered substantial business losses after a Secret Service raid in early March resulted in the seizure of his BBS and of his forthcoming fantasy gamebook GURPS Cyberpunk. The seizure of Jackson's computer equipment caused him to lay off nearly half of his staff and threatened the survival of the business. As subsequent revelations have showed, there was no good reason for this raid. It never should have been permitted to occur in the first place.

IMPLICATIONS

While helping defend the innocent is one role for the EFF to play, there is more at stake than trying to prevent individuals from being wronged. It is also a matter of rights for all of us.

The actions taken against Craig Neidorf and Steve Jackson—the prosecution of an electronic publisher and the seizure of a BBS and an electronically stored book-in-progress—demonstrate governmental disregard of the fundamental constitutional right of freedom of speech. I believe it is terribly important to extend to these new digital media the same strong First Amendment protections of freedom of speech and freedom of expression which we enjoy in our own lives and in the print media. The government should not be able to seize a bulletin board any more easily than it can seize a printing press. We must find ways for law enforcement to do its job in protect-

I regard unauthorized entry into computer systems as wrong and deserving of punishment. People who break into computer systems and cause harm should be held accountable for their actions.

Continued on page 187

Mitch Kapor is co-founder and chairman of the Electronic Frontier Foundation, as well as founder of Lotus Development Corp. and chairman of ON Technology. This editorial originally appeared online in EFF News and is used by permission. For information on EFF and EFF News, contact Electronic Frontier Foundation, 155 Second St., Cambridge, MA 02141, (617)864-0665, (617)864-0866 (fax); Internet: eff-news-request@eff.org.

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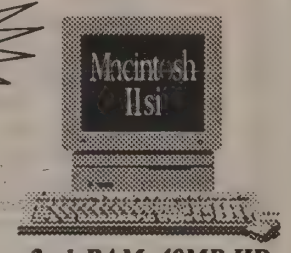

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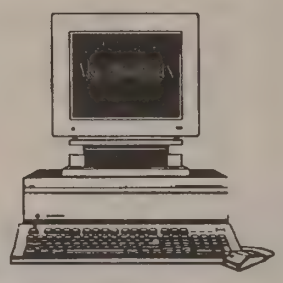

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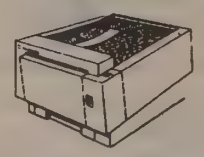

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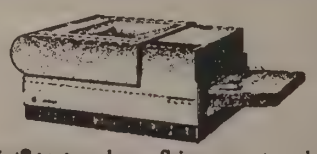

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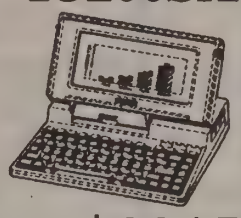

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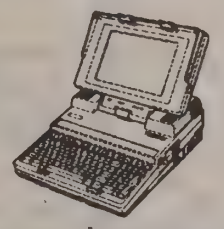

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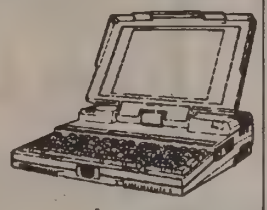

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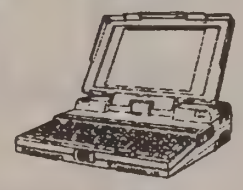

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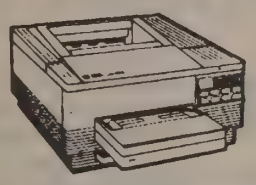

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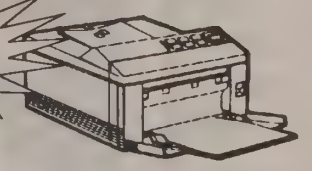

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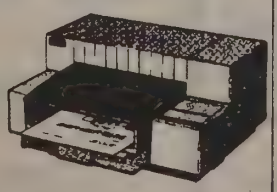

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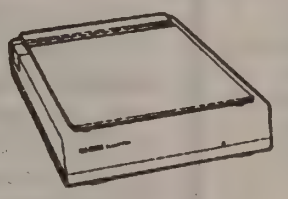

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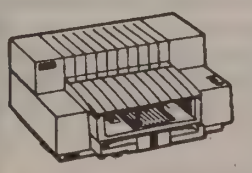

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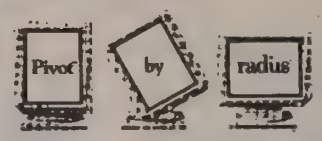

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The Pivot™ Display changes orientation to match the format of your work. Use the full-page orientation for word-processing and switch to the landscape mode to work on your spreadsheets. 4 levels of gray standard, upgradeable to 16-levels. Available for the SE30 or the Macintosh II family. Video card included in above price

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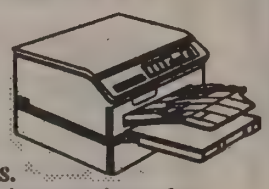
QMS ColorScript 100 Model 10



The ColorScript 100 uses a 68020 processor to produce the highest quality color graphics. This unit is the most inexpensive color printer on the market today! If you need color output, this is the unit for you!

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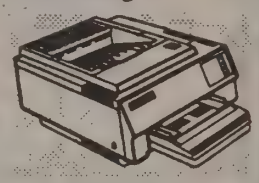
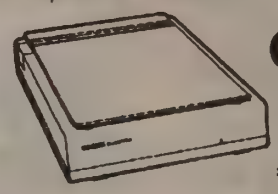
The PS-810 ia a true Adobe Postscript™ printer operating at 16Mhz, using the industry standard Canon engine. At 8 pages per minute, its also one of the faster printers on the market!



Abaton Scan 300



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Abaton's 300GS scanner is a high-quality gray-scale scanner. With the quality of far more expensive units and a price to fit in your budget, this is the unit for you!.

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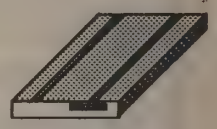

The InterFax 24/96 modem is a 2400 baud modem and 9600 baud fax that has more features then some of the most expensive fax machine. A must for any office environment using Macintosh computers!

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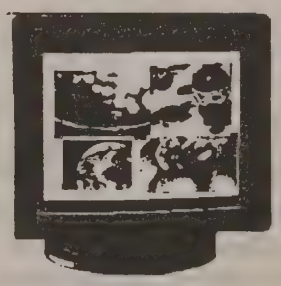

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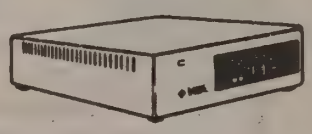

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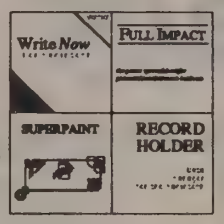

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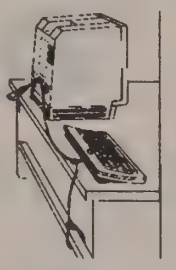

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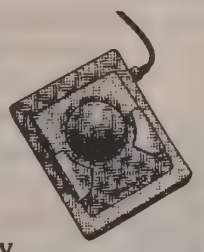

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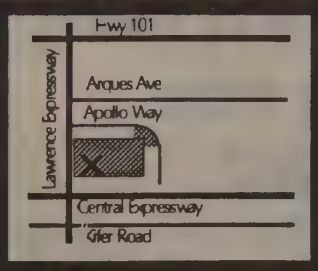

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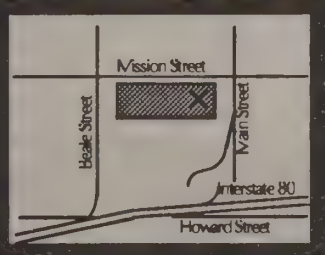

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Computers, Freedom & Privacy

New Technology Raises New Issues

BY JIM WARREN

Each month, this column concerns future applications of computers. Their most potent applications will enhance (or degrade) personal freedoms and personal privacy. The best assurance of a free and protected people is a vigilant, informed public. Applicable tidbits:

ACCESS TO GOVERNMENT INFORMATION

The federal Freedom of Information Act (FOIA) establishes that most records of Executive Branch agencies are accessible to the public (while recognizing the legitimate need to restrict some information).

Congress has passed no such legislation applying to its own records.

REALIZABLE FANTASIES

Public records offer numerous opportunities. For example, two years ago, former *New York Times* reporter David Burnham and Syracuse University Professor Susan Long founded TRAC—the Transaction Records Access Clearinghouse—which collects information from numerous enforcement agencies, especially IRS performance data.

There are, however, no statutory penalties for agencies refusing to honor FOIA requests. Researchers must sometimes pursue court action to force disclosure of information covered by FOIA. Burnham and Long have filed 13 FOIA suits against the IRS and have won all that have been concluded. Burnham is about to release a major book reviewing IRS practices disclosed under FOIA.

Copyright © 1991 by Jim Warren. All rights reserved. *Jim Warren founded* InfoWorld, *the DataCast proposal for broadcast-based paperless electronic newspapers, Video Initiative, Wireless Digital, Initiative, Inc. and one of the nation's largest public microcomputer conventions. He was founding host of PBS television's "Computer Chronicles" series, founding editor of Dr.* Dobb's Journal, *founding President of the Microcomputer Industry Trade Association and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

GOVERNMENT INFORMATION—CALIFORNIA STYLE

California has long had a Public Records Act, mandating that most state and local records are public. It explicitly names "magnetic or punched cards, discs, drums and other documents." Some agencies, however, interpret that to mean that computer-maintained information need only be disclosed in paper-printed form.

Like Congress, the Legislature excluded its own records from the Act.

PERSONAL PRIVACY—GOVERNMENT STYLE

In 1974, Congress passed the Privacy Act. It set standards for protecting personal records maintained by federal agencies. In 1990, the General Accounting Office questioned 189 agencies about how they obtained, verified, used and protected personal data. One hundred seventy-eight agencies replied, reported in *Computers and Privacy* (GAO/IMTEC-90-70BR, Aug '90).

Those agencies maintain about two thousanddatabases on individuals. The GAO reviewed the 910 largest computerized systems.

The Privacy Act applies to over 90% of these systems (827). It requires that basic information identifying such systems be published in the *Federal Register* "to prevent agencies from maintaining secret files on individuals." The agencies had complied with the 16-year-old law for 65% of their systems to which it applied (535).

PRIVACY—THE CORPORATE-GOVERNMENT CONNECTION

Over 75% of those 910 systems are networked. Many are accessed by state and local government employees not under federal supervision—and by private organizations. Many share personal information with the private sector.

Thirty-six percent of the agencies reported collecting personal information from outside parties such as credit bureaus and insurance companies (178). Information in 56% of the government systems can be accessed by outside organizations, "such as health care providers, marketing companies and insurance companies." For 75

Information in 56% of the government systems can be accessed by outside organizations, "such as health care providers, marketing companies and insurance companies." Seventy-five agencies reported "they did not know the purposes for which the personal information was being accessed by other organizations."

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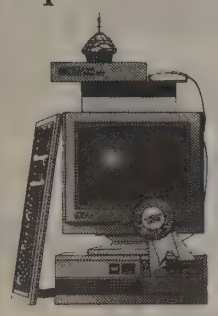

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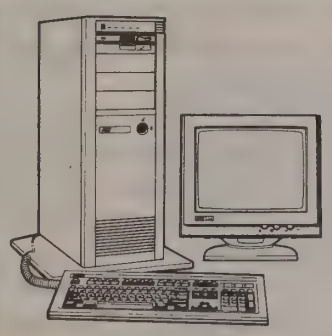
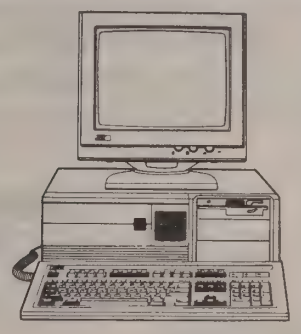


Choosing The Right Computer Products For the 90's



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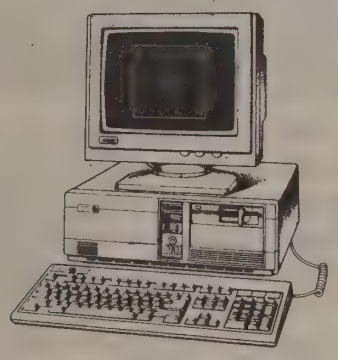

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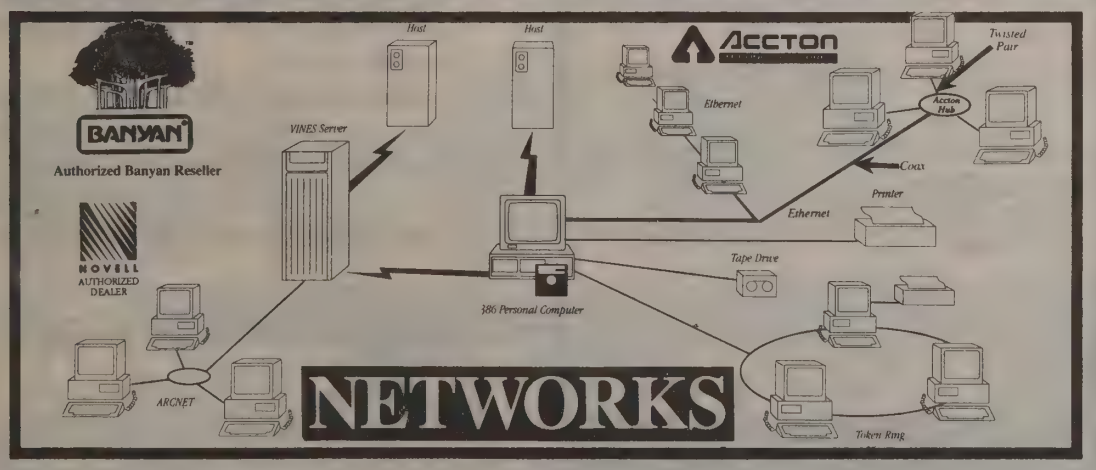

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of the systems, their agencies reported "they did not know the purposes for which the personal information was being accessed by other organizations."

COMPUTER THREATS— ILLUSION VS. REALITY

Illusion: Late last year, network news and major newspapers reported that friends of some convicted computer crackers were threatening to disrupt the nation's phone system.

Reality: No incidents occurred, and the next day, a few reporters mentioned that the threat was alleged by an "unnamed security consultant," and reported no other verification. (Note: Crackers are being imprisoned with hardened felons, who are likely to be interested in learning about computers and capable of demanding instruction.)

Illusion: There have been repeated reports that the AT&T phone crash not long ago was due to crackers.

Reality: AT&T has repeatedly stated it was its own internal programming error, and has detailed exactly what the error was to various telecommunications and computer professionals.

Illusion: Blaring headlines and flamboyant TV coverage of the past year imply that evil teenage computer crackers are a major computer threat.

Reality: The vast majority of computer criminals are insiders making illicit use of their authorized access, and the vast, vast majority of financial loss due to computer crime occurs in this context.

For example, the November 1990 issue of the *National Computer Security Association News* reports that likely "Security Threats" consist of: "Accidents & Errors (55%), Employee Dishonesty (15%), Fire (15%), Employee Revenge (10%), Flood (3%) and Earthquakes, etc. (2%)."

It also reports a 1987 Coopers & Lybrand study of insurance industry Disaster Recovery Planning: "Plan completely tested (4%); Critical tests done (11%); Some tests done (18%); Plan not tested (19%); *No plan (48%).*"

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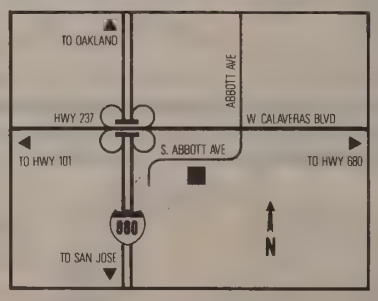

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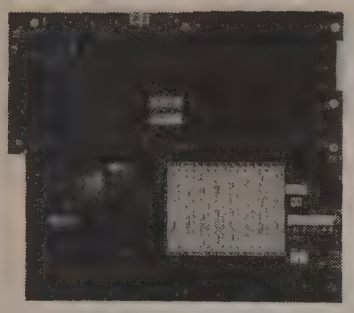

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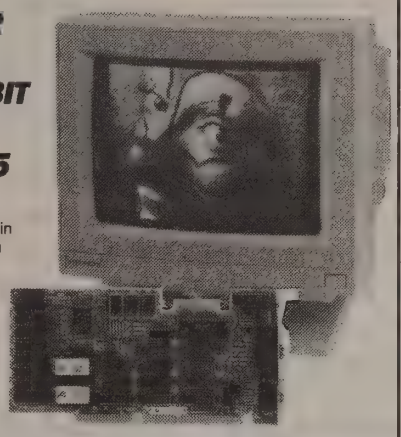

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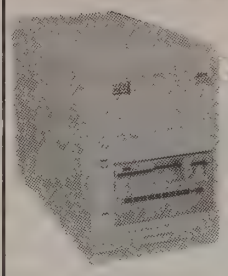

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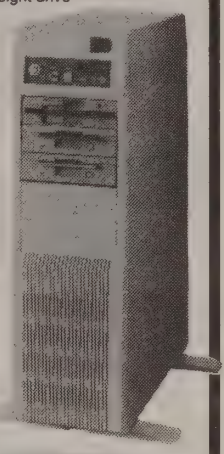

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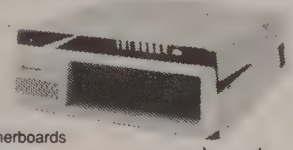

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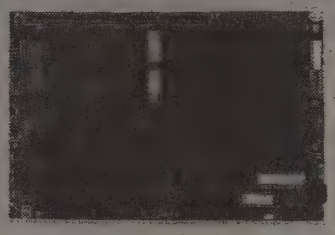

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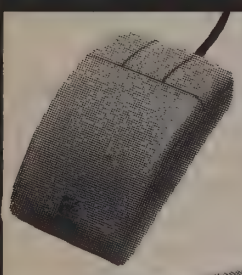

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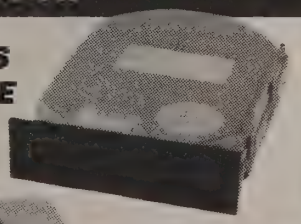

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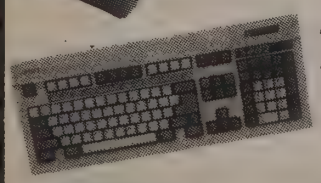

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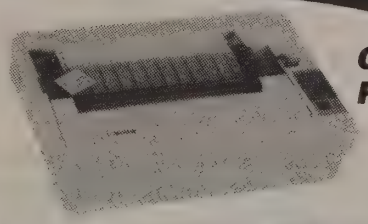

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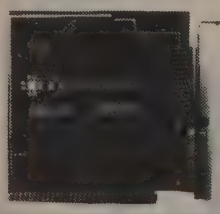

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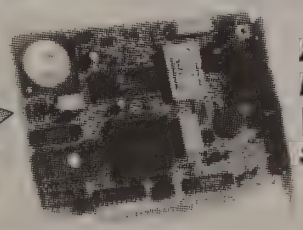

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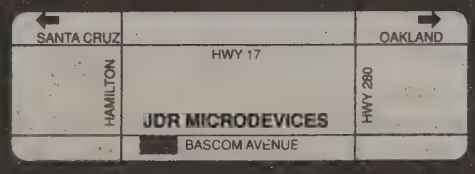

censorship, even though their self-control was proven adequate in years of reporting military action in Korea and Viet Nam.

Reporters' censorship complaints brought to mind the OTA's *Science, Technology and the First Amendment* (OTA-CIT-369, Jan '88).

Of all the technologies that aid free press, electronic publishing, free speech, peaceable assembly and citizen petition of the government to redress grievances, this report's *first* mention of a specific technology (except the printing press) began:

"Information and communications technologies, such as satellites, computers and digital transmission lines ... change [how] we communicate ideas...and incitements to action—they affect who can say what, to whom, to how many... With these changes will come new First Amendment challenges to the power of the government to regulate access..."

Of all the technologies they could have addressed, their first Chapter concerned "news gathering" and "... pitting freedom of the press against privacy rights and national security interests ..." The next entire section concerned "media satellites," stating, "... [Some] believe that the press will soon want to own and operate their own remote sensing systems dedicated to newsgathering ..." A later section in this First Amendment review concerned "Implications for National Security."

Is there anything more essential to a free people than timely access to information on which to base informed citizen decisions and action?

* The press was similarly censored when we invaded Grenada a few years ago.

COMPUTERS, FREEDOM & PRIVACY—THE CONFERENCE

These and numerous related issues prompted the First Conference on Computers, Freedom & Privacy, March 25-28, at the SFO Marriott near San Francisco's International Airport. Co-sponsors include CPSR, ACM, IEEE-USA, ACLU, Cato Institute, SIGCAS, SIGSOFT, ENA, VIA, EFF, Autodesk, Apple, The WELL, and others.

The Conference brings together, for the first time, leaders from all groups interested in these issues—users, crackers, prosecutors, enforcement officials, security specialists, information providers, networkers, sysops, civil libertarians, etc. It will open needed channels of communication, provide balanced review of the different issues concerning these diverse groups, and it will begin a needed process of consensus towards responsible, robust protection of the fundamental freedoms and personal privacy that are the foundation of any free people.

I am chairing this premier, nonprofit event. For more information, email cfp@well.sf.ca.us; write CFPconf, 345 Swett Rd., Woodside, CA 94062; call (415)322-3778; or fax (415)851-2814. ■

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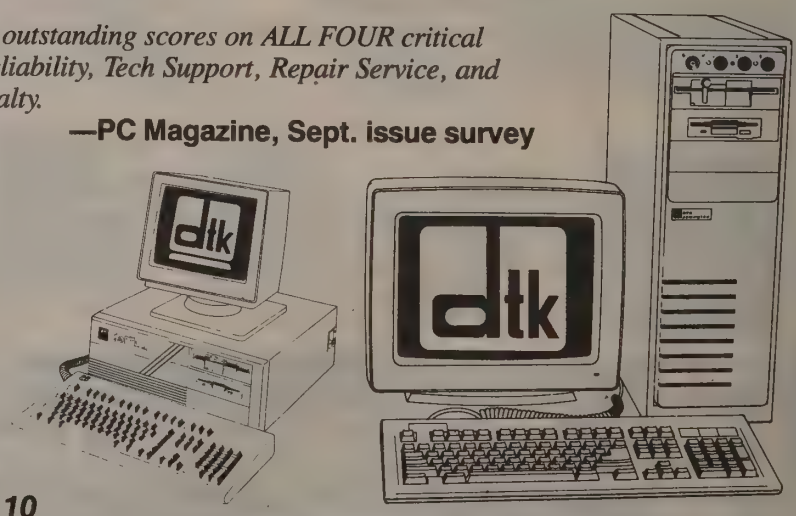

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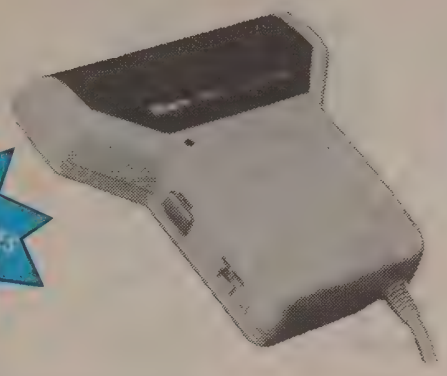

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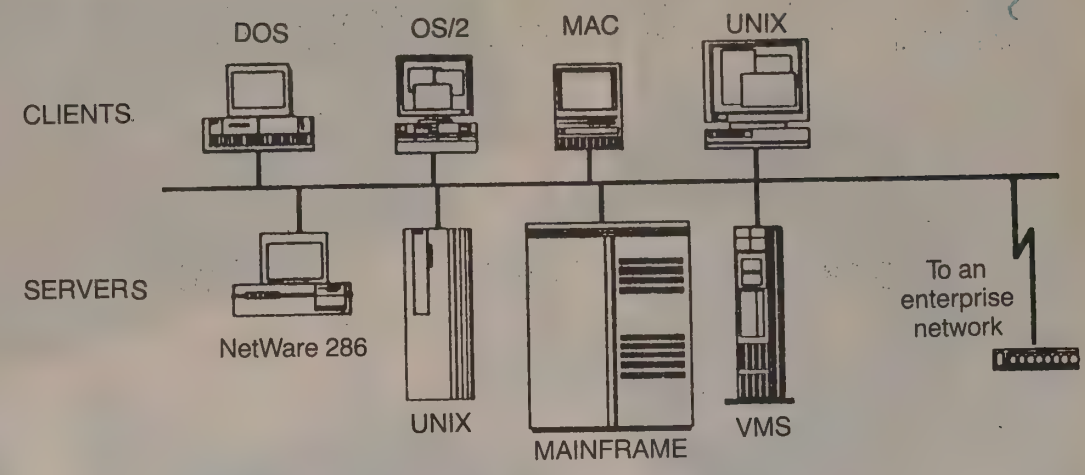

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Computer Crime: Beyond The Headlines

An Interview With Dorothy Denning

In the spring of 1990, I suddenly found myself thinking and writing almost exclusively about computer security. This was a weird turn indeed, as any earlier claims to my expertise in the field would have been about as valid as similar assertions regarding Japanese grammar, plasma physics, or Maori theology. I published, on the Net and later in *Whole Earth Review*, a piece about the conundra of computer law enforcement called "Crime & Puzzlement."

This thing had not long rattled around Cyberspace before I started to hear from the *real* experts. Their enthusiasm for a tyro's mucking about in such a sensitive area was predictably muted. And very few of them appreciated my assertions that computer crackers, taken as a group, might not be such bad kids.

So I was surprised and pleased to receive a friendly email message from Dr. Dorothy Denning, a senior researcher in computer security at Digital Equipment Corporation and long a major figure in the field. She also sent along a paper she had prepared for presentation at the 13th National Computer Security Conference in Washington in early October. The paper, "Concerning Hackers Who Break Into Computer Systems," was both heterodox and courageous.

There was nothing offbeat about its author's background. Before joining Digital, she had been a senior staff scientist at SRI International and an associate professor of computer science at Purdue University. She had written an authoritative textbook, *Cryptography and Data Security*, as well as many other published papers. In 1990, she received the Distinguished Lecturer in Computer Security Award for her work.

Despite the impeccability of these credentials, Denning had done something fairly adventuresome. She had gotten to know—close up and personal—some of these young digital miscreants her craft was designed to defeat. And she concluded that, in general, "hackers are learners and explorers who want to help rather than cause damage, and who often have very high standards of behavior." She also found "that the discourse surrounding hacking belongs at the very least to the gray areas between larger conflicts that we are experiencing at every level of society and business in an information age where many are not computer literate."

This was hardly the sort of thing I was hearing from SRI's Donn Parker. Nor did anyone in the US Secret Service, just completing a frenzied wave of computer confiscations called Operation Sun Devil, appear particularly appreciative of the moral gradients between cracker black and Telco white.

Not long after I first heard from her, Denning put both her principles and her reputation on the line in a more hazardous venue than a computer security conference: federal court.

The federal government had charged a University of Missouri pre-law student named Craig Neidorf with Interstate Transport of Stolen Goods for having published an internal Bell South document in his electronically distributed hacker's journal, *Phrack*.

This document, known as the E911 document, had been purloined from a Bell South mainframe by three Atlanta crackers and was alleged to be everything from a highly potent computer virus capable of shutting down emergency service all over America (as the Secret Service told a credulous *Wall Street Journal* reporter) to a text file of mind-numbing turgidity describing only the organizational format of Bell South's 911 bureaucracy. Whatever it was, Neidorf was looking at a possible thirty-one years for having spread it around.

Not only did the document seem quite harmless, the information was also publicly available from Bellcore for about $13. (Or considerably less than the $79,499 at which Bell South had valued it in Neidorf's indictment.) Even had it been sensitive, Neidorf had done nothing in publishing it which the *New York Times* and *Washington Post* had not done, with Supreme Court-adjudicated legality, in publishing the Pentagon Papers.

Denning volunteered her services to Neidorf's attorney in Chicago as a defense analyst and expert witness. She did not, however, get the opportunity to deliver testimony—because the government, after four days of trial, abruptly decided to drop the charges. It is thought that her input was a critical factor in dismantling the government's case.

Based on these experiences, she has since written an important paper called "The United

Interview By John Perry Barlow • Photo By Susana Millman

David vs Goliath

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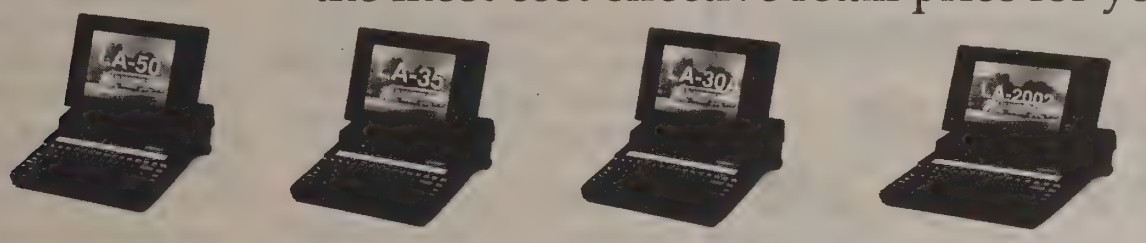

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CPU	386sx-20	286-20	286-12	V-20
BIOS	AMI	AMI	AMI	AMI
RAM	1 MB Exp. to 5 MB	1 MB Exp. to 5 MB	1 MB Exp. to 5 MB	640 K
EMS LIM40	Yes	Yes	Yes	N/A
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States vs. Craig Neidorf, A Viewpoint on Electronic Publishing, Constitutional Rights, and Hacking," and has continued to work toward opening both the minds of her colleagues and the channels of communication between her crisp professional world and the shadowy recesses of the Computer Underground.

When I spoke to her in mid-January, she was in her office at the DEC Systems Research Center, a bland brick building across the tracks from the Palo Alto train station. She was, as usual, calm, circumspect, cautious, and unemotional over the issues we discussed—issues which have lately incited many (including myself) into positions far more intemperate than any you will find taken in the following interview.

What is computer cracking?

That depends on who you ask or where you look up the word. It's used for different things. Some people use the word cracking to refer to breaking into computer systems. Some people use it to refer to removing the copy protection on software. I have no idea what else it might be used for—cracking codes, like breaking an encryption algorithm.

Well, you have a lot of experience with people who break into computers. How would you characterize that culture?

As I look into it deeper and deeper, I see that there are people with different kinds of motivations, different ages, different experience, hanging out in different crowds. There is no one culture. Most of the people that I have talked to are young students, young college students, who generally do it without destructive intent. For the kicks, basically, and for the curiosity and ego and whatever else, but generally without malicious intent.

But there are people who break into systems that seem to, by their behavior, demonstrate malicious intent.

Go into that a little further. Can you think of some incidents where malicious intent was pretty clearly demonstrated?

I think it's hard to demonstrate malicious intent, because how do you know what somebody's intent is unless you go and interview them—which I haven't done?

"One hacker that I talked with, who considers himself to be non-malicious, said that he was on a system, and saw some other unauthorized people on the system destroying files. So he threw them off the system."

It's especially hard because they're invisible.

Right. For example, one hacker that I talked with, who considers himself to be non-malicious, said that once he was on a system, and some others had gotten hold of the passwords to the system also. He saw them on the system destroying files. So he threw them off the system.

Now, were they doing that maliciously? Or were they doing it because they were incompetent and didn't really know what they were doing?

I've been trying to look for examples of clearly demonstrable mischief, and I'm not finding them in any abundance. I'm told, however, that a lot of companies are reluctant to mention or describe malicious attacks.

That is true. Companies are reluctant to describe any kind of attack on their equipment because it's perceived as not being good for business. It is true that companies have had some destruction take place as a result of attacks.

How widespread is it? I can't say, because nobody has done a study to see exactly how bad the problem is—what is the worst case, what is the average case, how many incidents of destructive damage have taken place?

When a company gets to the point of going to the government and saying, "This is what happened; I'd like you to at least look at this case and investigate it and maybe prosecute it," that's a sign that there's been enough of a problem caused by whatever was taking place that the company decided to invest its own resources into doing something about it.

You don't think that a company's going to the government mightn't be a preemptive action?

Preemptive of what?

Preemptive of perceived threats.

I would guess that a company would not put its resources into it, because you have to put in quite a bit of resources to investigate a case. I really don't know the answer, although I would consider it unlikely that most companies would report, say, that someone had broken into their system and gotten right off, and hadn't done any damage. I doubt that most companies would bother to report that.

Given that we don't have clear data on this stuff, why do you suppose that there seems to be a sudden elevation of perceived threat?

I would say that it's because more cases have been taken to the government by businesses recently. For example, with Sun Devil, you had credit card companies and banks claiming certain financial losses, mostly centered around credit card fraud, and some toll fraud. So you had some legitimate crimes being reported by these companies to the government, and the government responding to that.

Similarly in the other cases that came up, there were companies like the phone company reporting certain incidents to the government and the government taking action. The number of more serious incidents has increased.

So you would not say that eagerness on the part of any government agency to become involved in an expanding area of possible criminality is a major factor?

I can't assess whether that's true or not. I can say that the cases that we have been hearing about, to the best of my knowledge, actually emanated from the companies that were claiming the losses. They didn't emanate from the government in and of itself, operating without claimed loss on the part of some company.

The way it looks to me, after talking with prosecutors, is that the prosecutors are responding to complaints.

Again, we get into this very hazy area of intent, but in your discussions with computer crackers, do you find there to be much economic activity going on around this sort of stuff? Are we seeing people who are taking data with the idea of reselling it? People who are destroying data with the idea of causing economic hardship to the companies in question?

There are cases that I personally know about where the economic gain had to do with credit card fraud. I can't recollect any cases where people accessed information, then went out and sold it. [Except] there was the case of the German hackers who got into Cliff Stoll's system. They were selling information to the KGB.

I suppose you could include personal theft of services, as in the case of circumventing phone company billing.

Right. You're benefiting by not paying for a service that you've used.

There are also some interesting cases where crackers who have gotten into systems have then gone to the company and tried to sell their knowledge to the company, so they tried to profit from that. Some companies regard that as blackmail.

That brings up an interesting point, though, because it seems these crackers have a valuable body of knowledge. I think sometimes they know things about the phone company that the phone company doesn't know about itself. Have you given some thought to how we might integrate their skills into some more productive pursuit?

I've given thought to it and haven't come up with any answers!

You have the businesses out there, the perceived customer to the crackers who are developing their skills, and the businesses are saying, "We don't want to be in that kind of relationship with you. We would rather hire people who have learned their

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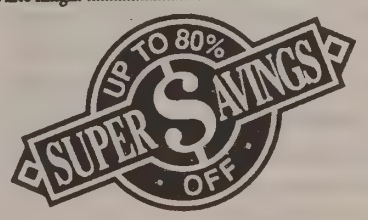

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skills doing legitimate things, or who we have trained." You can learn those same skills through courses and by trying to crack your own computer system with the consent of your employer. Those skills can be learned without doing illegal things, and I think most companies are saying, "We'd rather work with people who develop their skills using legal means."

Right. Though I find it interesting, in talking to people in the computer security community, that many have clouded backgrounds.

They do! [laughs] Ever since I wrote that paper that I gave at the conference, more and more people have come up to me and said, "You know, I used to crack systems." But times change. Ten years ago it wasn't perceived as being as wrong as it is now. Fifteen years ago, twenty years ago, I remember the standard practice in university computing centers was to hire the kids who broke into the computing center. It was not unusual.

Over time, what has happened is that you've got a lot of people who have trained themselves to become security specialists, so there's actually quite a lot of people who are competent to do the work now.

Also, computers are used more to support life-critical operations, such as traffic control and medical systems. Businesses rely on them. So there's a much greater concern about their correct use, their responsible use, than there was before. I think the rules of the game are changing.

I keep feeling like we've got to think of other ways besides the use of legal enforcement to assert the ethics of the computer community. And that becomes a much more complex problem. It's very easy for people to rely either on technology or the law to solve fundamental social problems. But I've never had much faith in those kinds of solutions. Do you have any sense of how we ought to go about reaching these kids, making them aware of the reasons for security?

I just have vague ideas. I think a lot of them don't really appreciate the concerns of business, and the cost to business of their acts. A lot of them are young and just haven't developed that kind of awareness. Especially if you've never had a job or you've never worked in business, you have no idea, really, on an experiential level, what the concerns of businesses are.

How you get that across, how you teach that, I really don't know. A lot of people learn their ethics, to a large extent, by observing other people. A lot of crackers probably get into it by observing their peers or their elders. Or hearing that it's okay, and it's fine. So they believe that it really doesn't hurt anybody, and so they slip into it without really giving it a lot of thought.

I think what it will take is some leadership from people that they will respect, to set a different example, and also to speak differently about it, speak about what the costs are. That breaking into systems does cost companies something, and using telecommunications resources does have a cost to everybody.

It seems, though, that the kinds of figures that get stated for computer loss or theft of services are so obviously overstated that they don't engender a lot of credibility in the target audience.

Right. Sometimes you see figures like "TWELVE MILLION!!"

Maybe we've got to do a little education with the business community in terms of responsible assessment of damage.

Either that, or maybe it *is* an accurate assessment, and we ourselves don't understand how it came about. I think some study to find out what the actual damages are would be useful, because you could go into it and find out how the company actually figured that these activities cost them a million dollars.

We keep talking about kids. Would you say there's an upper limit on this kind of behavior in terms of age? It looks to me as though there are very few people as old as 25 engaged in this.

I have no idea. In the study that I did, a couple of the people I talked to were over 25. I don't think I talked to anyone over 30.

If there's any correlation with age, why do you suppose that would be?

I think that as you mature you start to see the effect of the consequences of your actions on the world, and you see how that comes back to you. You hurt somebody or some company, and somehow ultimately things come back to you. If nothing else, by feeling bad or guilty. That's something that's learned as you mature, and that's why I think most crimes are committed by people at a young age. Across the board, not just computer crime.

Also, as kids go through school, graduate from college, take on a job, marry and have a family, or whatever they might do, they may not have the time or the interest in sitting at their terminal in the evenings cracking systems. They may just have other things that engage them more, including their work and so on.

Also, by getting into a company and working, their whole sense of ethics about cracking systems may change. A lot of factors can come into play as you get older.

I'm impressed that in spite of the absence of adult supervision or a fully developed value set, it seems as if the preexisting culture, the MIT-based computer culture, has extended itself far enough to have some preventive effect on malice. I'm impressed at what seems to be the ratio between unauthorized access and actual damage.

I wonder if there aren't ways to work with the culture that already exists and strengthen those values. Conversely, it appears that by residing our control point in law enforcement, we may be damaging the opportunity to do that.

If a company suffers losses, they need to be able to go to law enforcement. If none of the hacking cases were ever brought to prosecution or conviction, that would send a message that, hey, this activity is okay. It's like the laws are meaningless.

I think you need the law enforcement, and I'm not even sure I would go so far as to say the law enforcement's been too harsh in most cases, or that they've been going overboard in dealing with these cases. In fact we may need more law enforcement in this area. I'm not in a very good position to assess that.

But I do agree with you that we need to approach it from other angles much more. Approach it through the community itself. Because I think, for the most part, a lot of these hackers in the community do have reasonably high standards, certainly against doing things that are malicious or what they perceive as being harmful to other people.

Maybe we do need more law enforcement, but it seems like the most publicized cases of law enforcement have been out of scale with the actual threat. Maybe this is a good time to get specific and talk about the Bell South case, the Atlanta crackers.

It's my understanding that those kids entered a system that was essentially unprotected, and that actual damage within that system was negligible, and yet they're looking at steep fines and long prison terms. Wouldn't you say that diminishes respect for authority in the cracker community?

I can't remember exactly what actions the Atlanta crackers were charged with. So let me just talk about what kinds of things were happening with the phone company without being specific to the Atlanta case.

There are crackers who got into the switches and call forwarded some lines. At some level, it looks kind of funny and you kind of laugh. But from the phone company's point of view, that's damaging. It's not good for customer relations. There you are trying to provide service to your customers, and it's not being provided reliably. You really can't tolerate that kind of thing.

Another thing that some of these crackers did was to reprogram things so that pay phones were free. Again, from the phone company's point of view, that's damaging, because they've got to go back and change it and fix it.

I also believe they installed Trojan horse login programs so that even though they may have gotten into the system initially through unpassworded accounts, they were able to capture passwords and then come back in through password accounts, and probably get more privileged accounts that way. Changing some of the system routines is, from the phone company's point of view, damaging to your system, because you've got to go clean that up. You have to get the system back into a safe state, which can take some work, because you have to figure out which files have been changed and then correct them.

I believe that crackers also got into some administrative type computer systems, and did do some file destruction and modification on those systems. They also got into the phone system and eavesdropped on lines. When you add all that up, from the perspective of the phone company, the people that are getting into the phone company's system are causing damage.

Who decides whether or not somebody has caused damage to the system? Do you and I decide, or does the owner of the system decide, or maybe the courts have to decide?

Usually, society expresses itself in the courts, through a jury of peers and other mechanisms to assure that le-

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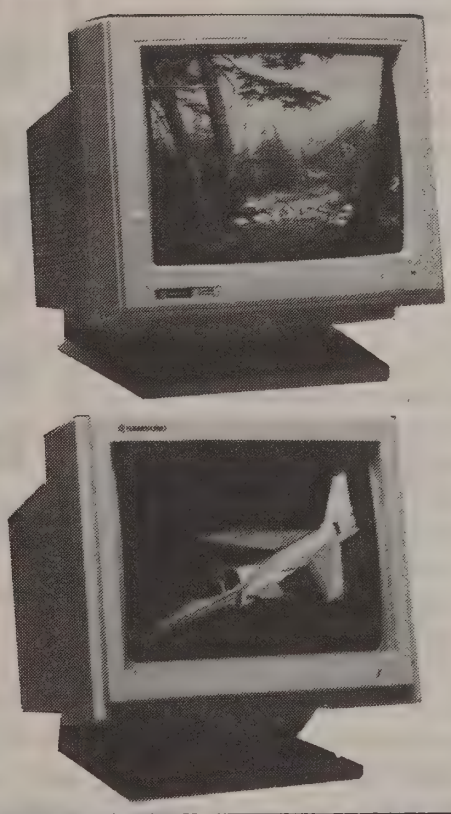

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gal results represent a consensus of social understanding. But one of the things that concerns me about this is that because of the technical nature of these crimes, there's no such thing as a jury of one's peers. It seems increasingly that the ethical system being supported is that of a particular company and not of society at large. There may be a disparity. When I talk to people about computer break ins, I find a widespread lighthearted response to this. Which is not what you get when you talk to somebody from Bell South.

I can tell you my experience in the Neidorf case, where I had the opportunity to observe the jury. After the trial we interviewed five of the jurors, and so even though the trial had never gone to the point of jury decision, it was very interesting to hear what the jurors had to say about it.

Keeping in mind that the government dropped all the charges, the jurors clearly had a sense that breaking into systems is bad. Robert Riggs, the hacker who got the 911 document, was one of the witnesses. The jurors all said that what Riggs did was wrong and that he should be dealt with appropriately.

In your personal opinion, do you think he has been dealt with appropriately? Do you think that punishment is in scale with the severity of the facts?

At a gut level, I feel that the punishment for him was too strong. I know less about the other two cases than his, but I have a sense that in all three of those cases both the fine and the length of sentence were too strong. I don't know what would have been appropriate.

That brings us into an interesting area, the evaluation of damage. The 911 document was originally valued at $79,499. Bell South, using some of the same techniques, decided that the password file was going to cost $233,000 to restore. Personally, I think this is very damaging, because there's no way that I could imagine anybody spending that much money in order to restore a password file.

Well, Bell allegedly spent a lot of money on the investigation and on improving their security.

But those figures are also a little incredible. They're talking in terms of millions of dollars.

I believe they actually spent that.

Well, this is maybe an admission of grave inefficiency...

I think the reason why they had to spend it is because they hadn't spent it before. Like any company, you're always operating in an environment of risk assessment, and trying to perceive how serious the risk is so you can decide where to put your resources, because you can't put them everywhere. If you put them on making your security tighter, that's going to be fewer resources that you can put into developing your technology to provide new services to customers. You're always making that assessment.

Well, enough hackers got into the Bell systems that finally they said, "We've got to put more resources onto security." And they did. Should they have done it earlier? I don't know. Those are hard business decisions to make. In any case, they made the decision then and not earlier. Is it fair to pass along the cost of that decision, then, to the three Atlanta hackers?

They certainly didn't pass along the whole cost. I believe that they spent millions of dollars in the investigation and in improving the security of their system, so they clearly didn't pass on the whole cost. But did they pass along a disproportionate amount? I think so.

Why did you decide to become involved in Craig Neidorf's trial?

A couple of factors. One was that I made the assessment that he wasn't guilty of the charges of conspiring to commit fraud. And that the claims that were made about the 911 document were not valid—I thought they were much too strong. I basically believe that he was innocent.

It was partly a sense that I couldn't let somebody go to trial, and possibly lose, and live with that, knowing that maybe I could help make a difference.

I was also concerned about the possible implications it could have for First Amendment rights of electronic publications. Certainly as the indictment was drawn up it wasn't a First Amendment issue. But several lawyers claimed that there was a First Amendment issue. To that extent I also didn't want to see the case lost.

If we've got ambiguity in the distinction between interstate transport of stolen property and the exercise of expression, something has gone awry. I'm increasingly interested in how we're going to define ownership of information and the kinds of techniques that we're going to use to assert that ownership. Anybody with a stamp can declare a document proprietary, but does transfer of that document by the wrong people then become interstate transport of stolen property?

Well, in order for it to hold up in court you have to demonstrate that it was a trade secret. Which means that the information was not in the public domain. In the Neidorf case, we showed that the information was in the public domain, and not a trade secret.

I got involved in this stuff in part because I felt that Bell South and the Secret Service were treating the 911 document as being a much more critical and sensitive document than it was, in fact. Given the general level of ignorance about these matters, what's to prevent a company from abusing people's rights any time it feels that it wants to assert itself legally?

There's nothing to prevent a company from doing it. You only have the courts there to make sure that justice is served. In this case, justice was served. I don't really know what was going on when they made those claims, but my guess is that whoever inside the company made those claims believed them. I don't really think they were trying to put one over on the government.

It's a huge company, and sometimes your right hand doesn't know what your left hand is doing. One of the witnesses from Bell South, who was basically responsible for the 911 document, was not aware that information about the 911 system was published in journals and in reports that people could order from Bellcore by dialing an 800 number. So from her point of view this document seemed proprietary because she didn't realize that a lot of this is public domain information.

The other thing is that somebody inside Bell made an assessment that the document was sensitive—one of their main concerns was social engineering with the document.

Social engineering, meaning use of terms that were found in the document to indicate inside knowledge?

Yes.

We're looking at another case right now where intellectual property seems to be a pivotal issue. In both of Len Rose's cases, he was in possession of UNIX source code. AT&T seems to want to hang him so high that anybody who has ever had source code on his disk will see him. And yet in talking to people in the UNIX community it sounds like there's unauthorized source code on an awful lot of disks.

What do you do when you've got a common practice which is at great disparity with the law? How do you bring the two into some tighter correlation?

That's a hard question. It may be that you have to prosecute in some of the cases in order to bring those practices into keeping with the law, but I think you need to go very gently in your prosecution, and acknowledge that this has been a common practice. We need to change the practice.

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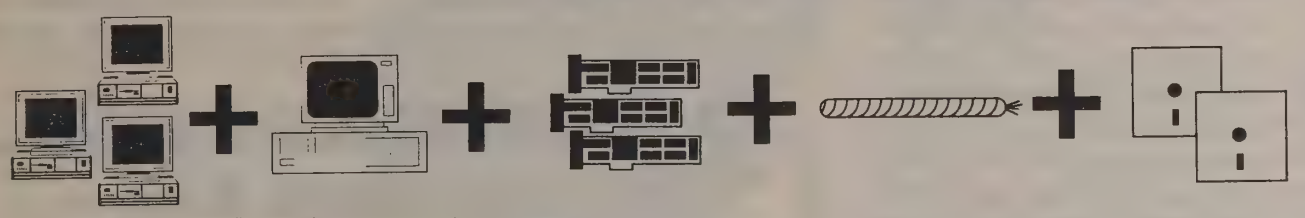

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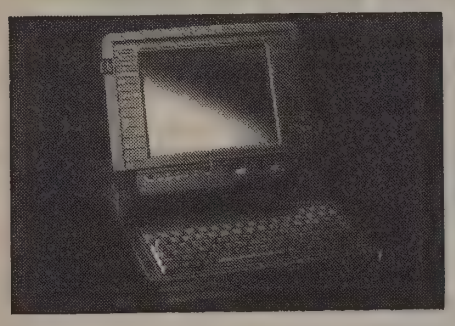

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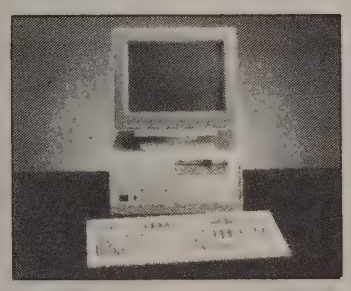

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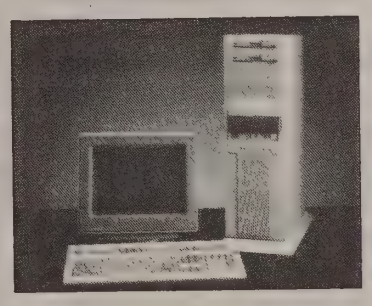

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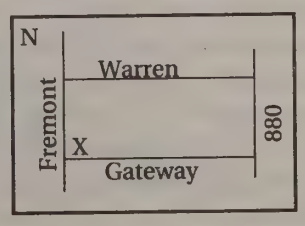

Don't you think it might be easier to try to change the law to correspond more directly with the practice than to change the practice to correspond with the law?

You mean change the law so it would not be illegal to have proprietary source code?

I wouldn't say that, but I think it's a dangerous situation when ethics and the law are not very tightly bound up with one another. I think it's a lot more difficult to change ethics than it is to change the law.

But there's other options. Let's look at the example of software pirating. It's illegal, and most people regard it as also being unethical. So you can say, "Let's try to teach better ethics." And yet a lot of the software pirating keeps taking place because of price. So a solution in that particular case comes when the software can be priced and distributed in such a way that it's economical to actually play the game legally.

In schools, for example, a lot of the teachers don't realize that when they have some software that they'd like to be able to distribute en masse throughout the school, that if they approach the company and say, "Look, we want a hundred of these around. What kind of price can you give us on a hundred versus one?" that they may get a price that's reasonable so they can do it ethically and legally and not have to resort to illegal copying. I think the way things are packaged and priced has to be taken into account.

Why, for example, is UNIX source so widely distributed? Why do people have it? What do they want to do with it?

Well, it doesn't appear that they're trying to resell it. First of all, I don't know that software piracy has an ethical statement attached to it, based on the fact that it's practically universal. I think there is a widely observed system of ethics about paying for software ultimately, but I don't know anybody who wouldn't try out a program before he buys it, and that is certainly prohibited by the law.

And there aren't any mechanisms I know of to allow this kind of common behavior. If I want to suddenly deal with UNIX source code legally, I have to lay down a considerable chunk of change. I may not want to become a UNIX wizard, but before I make that assessment, I'd want to be able to spend time working with UNIX in a fairly intimate way.

I just feel like we're quitting a little early in trying to find real-world solutions to these problems before resorting to legal solutions. The laws at present don't allow much flexibility in this regard. You'd have to change the laws, I think, in order to make it possible for people to try out software before they buy it.

The question is, who makes the decision about whether or not it's okay for somebody to try out the software before they buy it? If you put it in a law and say, "Okay, it's legal to try out software before you buy it," then the government's basically imposing the norms on companies and not letting companies decide for themselves what kinds of products they want to produce and how they want to sell them and so on.

I guess I would rather see the company that produces a product be able to make its own decisions about how it sells it. I think a company should be able to decide "I'm producing this product, and I don't want anybody to use it unless they give me $1000." And let the market take care of it from there. If that's not a good business decision, if people are starting to copy it on their own, somehow the market would eventually bring about the right pricing. I'd rather see that route than have the government make the rules about what companies can and can't do. I don't like a lot of government regulation.

But I think what we need to do is have some forums for discussion. We need to have people thinking about these issues and writing about them. And looking at the economics of it. It would be interesting to see some serious studies made of the costs of different strategies. What are the economic effects of putting a product out there for people to try it, initially without any fee whatsoever?

I want to talk to you about access to information and the control of access to information. I tend to take the canonical MIT view that there ought to be free access to generally useful information, but you've got institutions that regard information as an asset which is not publicly distributable. There's the general tendency of information to leak and establish its own freedom. Do you think we have any kind of social consensus about what constitutes ownable information, and, given that, do you think we have any consensus about how to enforce ownership?

I'm not sure there's any consensus regarding information at all. I think that there is a sense on the part of industry that if they create or produce information then it's theirs to do with as they please. Put copyrights on it or patent it or whatever strategy they want to use to protect their asset. I'm not sure that is public consensus.

If you go to the universities you find that there the attitude is much different. That is, if you create and produce information, you want to distribute it, disseminate it. The reward system encourages that, whereas the reward system in industry is a different game.

So you've got people going to college and getting one set of understandings about information and then going into business and getting another one. Sounds like a recipe for cognitive dissonance.

It would seem that way.

The fundamental basis of the social contract is property and the ability to own it and the ability of both government and one's fellows to respect that ownership. I'm concerned that we're losing on all those fronts. People are trying to own things that are not intrinsically ownable. And other people, recognizing this, are not respecting property rights. We ought to start thinking more about ownership of the capacity to execute or package or convey information than of the content itself.

The practical difference would be in terms of how you guarded that information content. If you're confident of your ability to deliver the information in a more succinct and salable package than anybody else, then you're less concerned about other people getting access to that information, because your protection is the ability to package and distribute, and not simple ownership of the information itself. Copyright law used to vest your copyrighting the assembly of content rather than content itself.

This might seem abstract in terms of computer security, but it seems on the other hand that a lot of what drives unauthorized access is the assumption that what one is accessing belongs to him in the first place. Or belongs to society in general.

I'm not sure to what extent that really is a factor, or a story that kids might tell after the fact.

"I think the biggest thing we're doing wrong in computer security is that a lot of systems out there are not using standard practices for preventing very trivial kinds of breakins."

Kind of like "I crack so I can show you the holes in your system"? Which never seemed very credible to me...

Right. "I crack because I think I have the right to access that information." Maybe it's part of it.

Has anybody ever thought about trying to make access less entertaining? Has anybody tried to come up with ways in which the game would be a drearier pursuit?

I remember having a conversation with somebody about that once. We were thinking about what would happen if, when you cracked into a system, somehow you got thrown into some program that made you fill out this long bureaucratic form and there was no way out of it! [laughs] You couldn't hang up, you had to do it.

Exactly!

And the other thing I thought about

Continued on page 224

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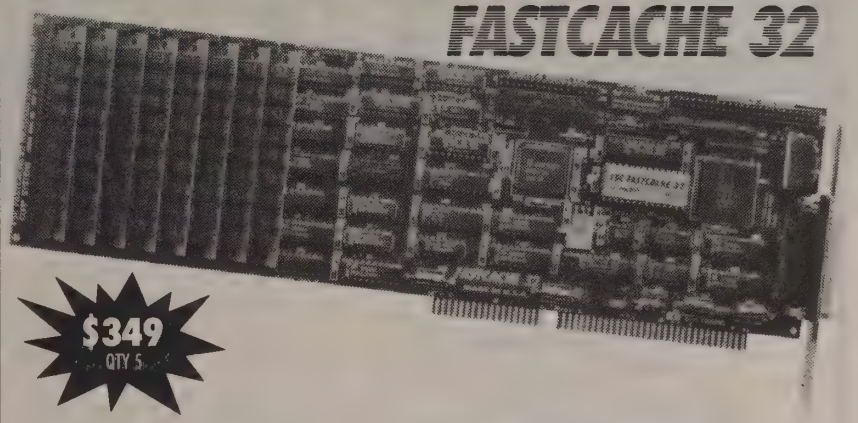

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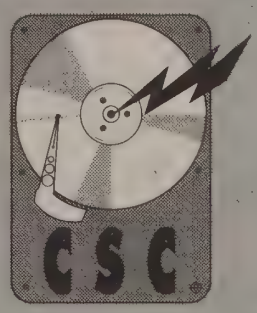

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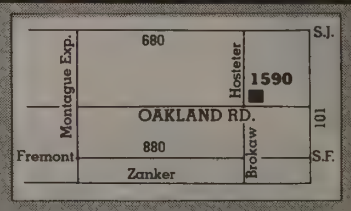

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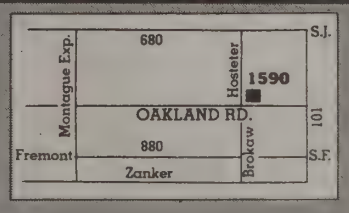

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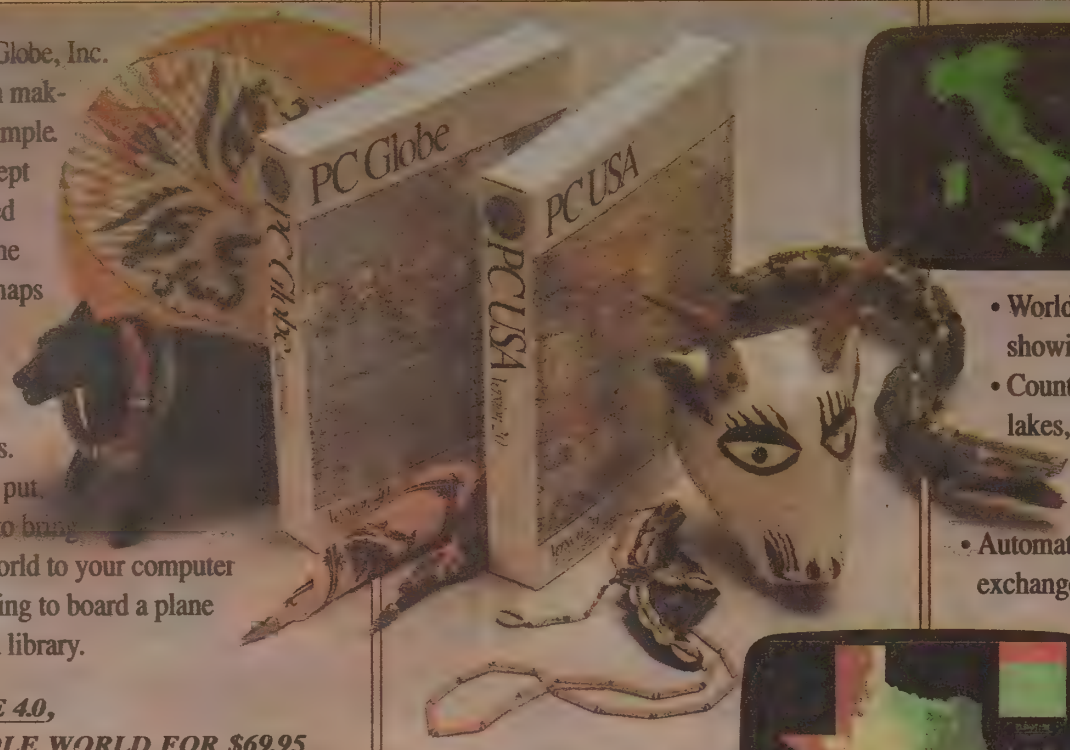

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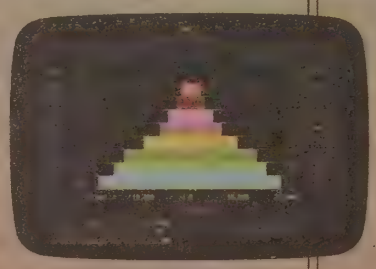

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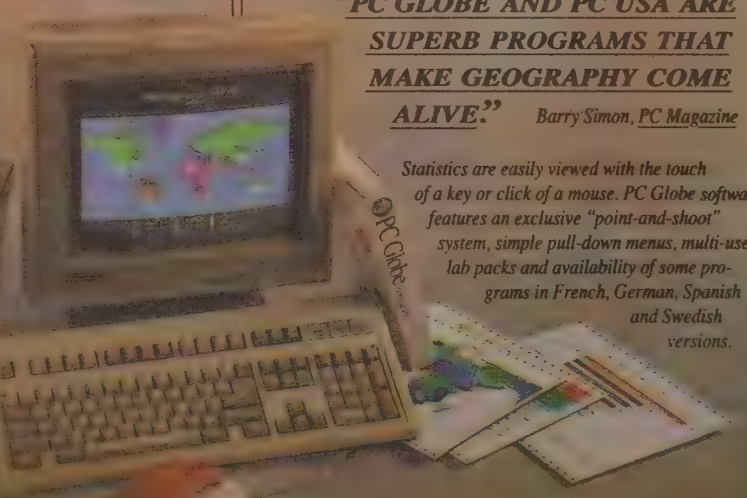

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Cliff Stoll's Practical Network Security Tips

Avoiding Paranoia While Making Things Work

BY MARY EISENHART

One day in 1987, Cliff Stoll, an astronomer at Lawrence Berkeley Laboratories, noticed a slight accounting error on the lab's computer system. After many adventures and setbacks, chronicled in his best-selling book *The Cuckoo's Egg*, the anomaly led to the discovery of some enterprising West Germans who were breaking into US military computers and selling the resulting information to the KGB.

These days Stoll is mostly concerned with getting back to astronomy, not with promoting himself as a security expert. He says: "My direction is towards computers as machines to solve my problems, not as ends in their own right. And as such I'm just a typical ordinary computer user. It just happens that I got caught in this vortex of computer crud and chased these clowns around who were breaking into all these computers."

However, in navigating the vortex of computer crud, Stoll picked up a lot of practical experience. So, when he was in town recently on a book tour, we took advantage of the chance to dispel some ignorance and pick up some useful advice.

Computer paranoia is big business. I've run into a few people who are pretty sleazy about sowing computer paranoia and taking advantage of people's ignorance to push sales of their products.

And I've known people to say, "I have my Macintosh and it's plugged into the wall. Should I be worried about hackers breaking in?"

The effect of computer viruses, computer hackers breaking into systems, people screwing around with other people's systems, is to spread paranoia. The sad thing is, the people who are hurt aren't the computer wizards. The people who are hurt are those innocents who are afraid to use a computer now, simply because of somebody doing what they consider a fun prank. Robert Morris's Internet worm is a good example.

There's so much hysteria about computer security that it's difficult to get a sense of what's realistic. What can relatively ordinary people do to keep intruders out of their systems without getting into this armed-camp state of mind?

For most people who have a small computer sitting on their desktop, which might have a modem with which they dial out periodically and get stuff off the bulletin boards—they have nothing to worry about. No one else can connect into their machine. When they're using their modem, they're in charge. When they disconnect, there's no way somebody can connect in. There's very little to be worried about.

Conceivably you might worry that if you get electronic mail over some bulletin board, somebody else might be reading it. In which case, don't send supersensitive things. Don't send your million-dollar competitive contract over a public network.

The people who worry about securing their systems are companies, institutions, governmental places that have lots of people using big computers. As soon as you're using a computer where more than one person is using it at the same time, where several people are sharing data, then you start to worry. Then you ought to make sure you've got passwords to protect things. You ought to worry that someone else can't read your information.

So what do you do? You make sure there are good passwords.

What's a good password?

A good password is one that never shows up in a dictionary, one that you can't guess. It's not a name, it's not a place, it's not a thing. It's not easily spelled. It might have a number or two in it. It might have a letter or two in it. It ought to be six or seven characters long and be hard to guess.

Then, treat your password like a toothbrush. Change it every few months and don't share it with anyone. If you have to give your password to someone else, you're doing something wrong. If your file system can't allow multiple users and you have to give your password to a friend in order that they do something useful, then you're doing things wrong on the big computer. It's designed wrong.

Accounts on big computers shouldn't be inherited. When an employee leaves, the account should be frozen and a new account given to the next employee rather than inheriting it.

Sensitive things that you really worry about—encrypt 'em. Find an encryption method so that the plain-text information is not sitting on your computer. This means anything that has intrinsic worry value to you—something personal, something that has money attached to it, something that your business or personal interest holds close to you.

In other words, find a way to separate the wheat from the chaff. Protect only that which is valuable, by encryption, by storing it on your own private machine and keeping it off of the public computers. Keep the large computers free from things that might be sensitive to you. If you have something valuable, keep it on your own personal computer and then lock your personal computer up, keep that disk safe.

What about from a system or network administrator standpoint? What would be some things to watch out for?

When you're administering a system, monitor it. Watch to see what's happening on it.

Does that mean reading people's mail?

Oh no, not reading people's mail. Don't read people's files. Much more importantly, monitor when the system's being used. If you have a bank computer, figure out when it's being used most. Nine to five.

Is it being used at midnight? How much is the computer being used between 3 am and 5 am?

And then watch for weird things happening. For example, "Hey, we're getting a lot more computing cycles tonight at 2 am. What's happening? Could it be that somebody's using it who's not supposed to?"

Keep audit trails of people's activity. When somebody's in your system, and using it, watch for strange things happening. Be aware of what might be going on that is out of the ordinary. Is somebody logging in from a distant computer? Are files which are extremely sensitive being accessed?

This doesn't mean watching over somebody's shoulder. Rather, it's watching your computer, watching your database, and seeing that it's being used in the way it was originally designed to be.

In a normal business setting, would that involve going to the extent you did in the book of running printers 24 hours a day to capture all the sessions?

Oh, no. We only did that after we knew what this guy was doing. We wanted to watch him.

It would be impossible to watch everybody's keystrokes even if you tried. Just watching this one guy was almost a full-time job.

Rather, watch the audit trails that tell you in a very compressed form what's happening on your computer. What files are being accessed that shouldn't be accessed? Who's trying to become root? Is somebody trying to crack passwords?

Watch to see bad password attempts. When somebody tries to log in four times using systems accounts, watch for it, and chop things off when need be.

In designing systems, make sure that they're designed for some degree of security. Don't just secure the operating system, watch the local area network. Somebody who has access to your local area network can do a lot of nasty things without ever logging in to a computer—for example, you can dial in to somebody's modem, get into their local area network, and then turn around and dial out from it and have free telephone calls. Very worrisome thing—don't allow looparounds on your local area network.

Don't allow a person to use any of your computing resources at all without presenting a password. Don't let somebody access one of your network servers without presenting a password—otherwise they can masquerade as you, even though they're 2000 miles away.

Audit your wide area network use. Be careful of somebody taking advantage of your wide area network connections without your permission.

What would indicate that something of that sort was going on?

Watch your bills. If you subscribe to Telenet or Tymnet on an outbound service, you get your bills every month. Look at them just like you look at your long-distance telephone bills at home. "Did I make this call to Portland, Oregon? Oh, yeah, I have a friend up there. Did I make this phone call to Peoria, Illinois? Jeez, no, I didn't. I don't know anyone in Peoria. There's no reason for it." "But it happened

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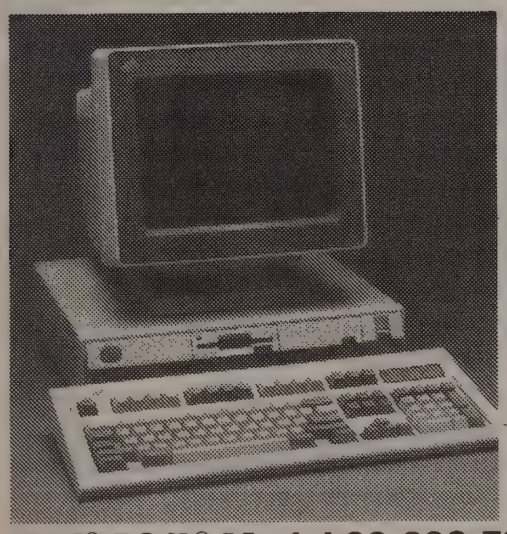

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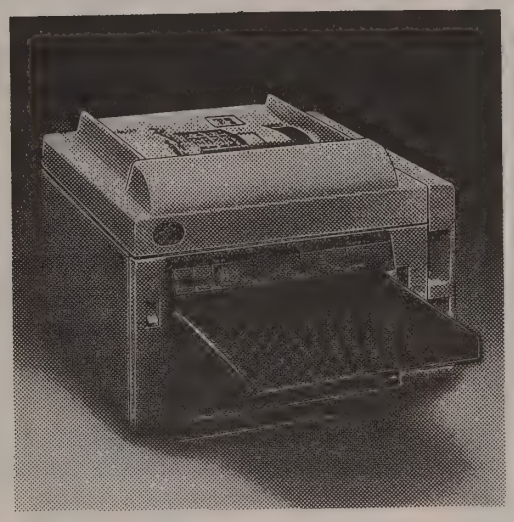

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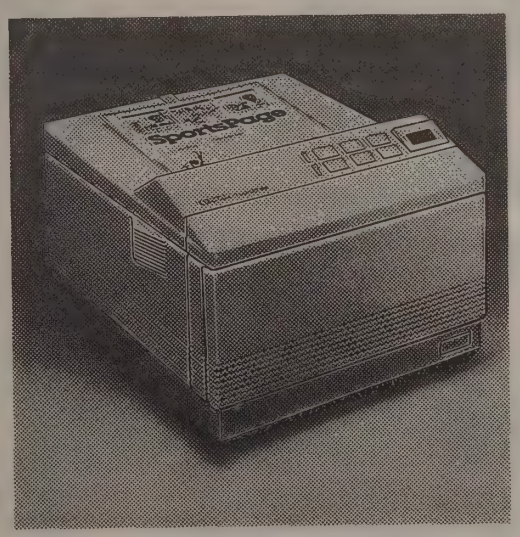

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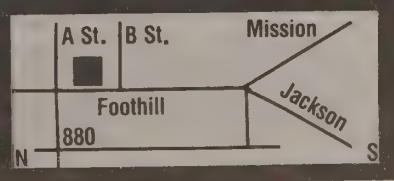


ten times in a row." "Oooh. That's interesting. Perhaps somebody is abusing my system and calling Peoria though my network connection."

Watch these things. Look at them. It's fast to analyze, you're not invading anyone's privacy, and you're certainly protecting your own assets.

In designing your system, make sure the pathways are direct enough for high-speed communication, and make sure that it's understandable, so if need be you can trace it out. Local area networks oftentimes are tough to trace, and it's hard to figure out where somebody's coming from, where they're connecting into.

In purchasing equipment, make sure that the operating system itself has reasonable security in it. It's a rare person that will buy an operating system or choose a computer based on its security. On the other hand, you should at least ask, "Are passwords allowed in this? Can I keep a particular file secret? Can I share files without sharing other files?

Security in UNIX is not suitable for a lot of purposes. You need to do things to make it more secure. For example, file sharing has only three levels.

Yeah—user, group, and world. You can do better than that on a Macintosh network—you can say exactly who should be able to read the file.

I was amused by the religious wars in the book between the UNIX guy and the VMS guy. Are there situations where DEC's VMS is more suitable than UNIX?

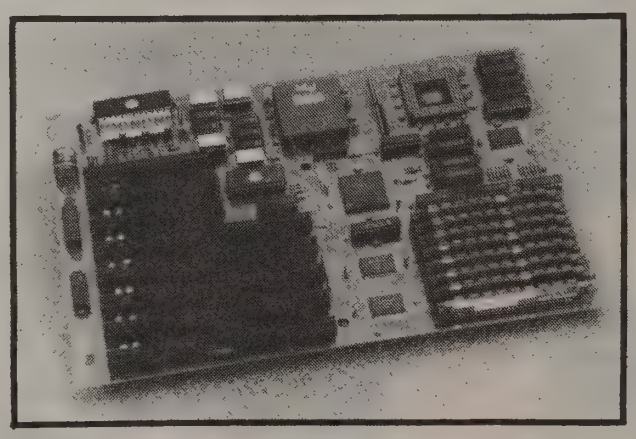
Oh, VMS is far more secure than UNIX. Like what you've described—"I want this file accessible by only this number of people." In VMS you have something called an access control list and you say, "Make this accessible to the following eight people."

Beyond that, it's considerably more friendly. Unfortunately, like the Macintosh, it's proprietary, so people hate it.

My complaint with securing large operating systems is that most of the people running computers don't have time to pay attention to security. It's way down on their list of things. Most important is answering the boss who wants to figure out "How do I get this spreadsheet to work?" And then you start worrying about "How can I teach the secretary how to use this obscure word processor?" "How can I link up these five computers so that this group is happy?" "How do I teach vi to somebody?" "How do I install this new editor?"

The people who are in charge of these systems are overworked, and they don't want to deal with security. It gets in their way. It gets in everybody's way, and it makes unfriendly systems even less friendly. Because you now have more passwords and things.

And that's the sadness to me. It's that sadness that this paranoia of people breaking into computers, people stealing somebody else's information, causes enough paranoia, causes lots of extra locks and keys and passwords that make our systems even less easy to use. I'd much prefer to just trust everybody. ■



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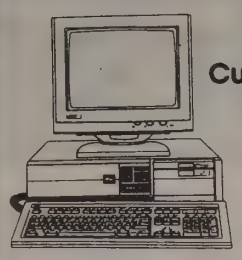

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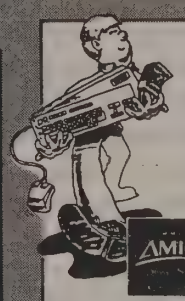

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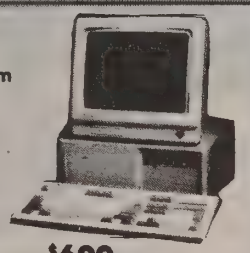

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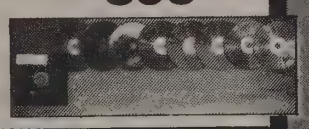

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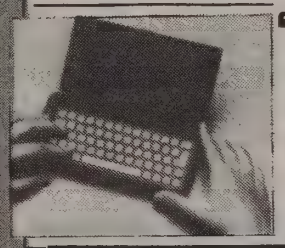

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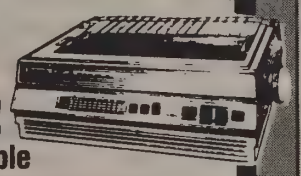

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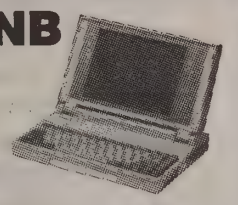

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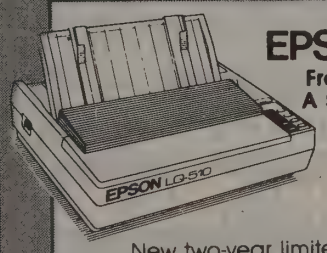

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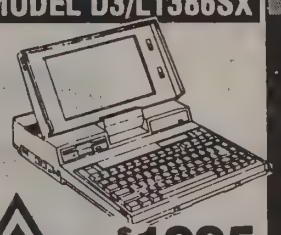

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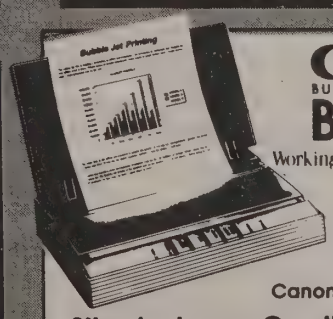

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Security In The Single-PC Office

Even If You're Not On A Network, Your Data May Be At Risk

BY PAUL HOFFMAN

You may have the impression, from other articles in this issue, that security is a big issue on multiuser systems and on networks. If, like many *MicroTimes* readers, you have an unnetworked, single-user PC, you may feel that you don't have to worry about security as much as those who use big systems. Nothing could be further from the truth. Just because no one can connect to your system by modem, don't assume that it is secure.

The two most important security concerns for single-user systems are data loss and secrecy. These are important to all users, not just businesspeople who use their PCs all the time. They are important regardless of the brand of computer you use and the cost of the computer.

BACKING UP YOUR DATA

The field of security goes far beyond preventing others from accessing sensitive data. In order to be "secure," you need to know that if something disastrous happens to your computer, you can still continue to work. In addition, you need to be confident that old data that may be needed in the future is accessible, even if it means going through some inconvenience.

Imagine that your office burned down and the next week you were called in for an IRS audit. You are much less likely to survive an audit if you have no paper or computer records at all than if you can get your old computer records from a backup.

Does this sound like the oft-heard mantra, "Back up your data?" You bet it is. How can you feel secure when a single software or hardware glitch could wipe out your ability to survive an IRS audit? Or require you to reproduce months of work? Face it, even if the process of backing up is tedious, it is incredibly easy. Recovering work that was not backed up is almost impossible and is certainly time-consuming. Businesses that don't back up their data completely trust that their computers will never be stolen, or damaged in a fire or earthquake. They are sure that both their hardware and their software will never mess up. In other words, they are fools.

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Backup programs are inexpensive and easy to use. Most come with suggestions on how to do daily and weekly backups. Many, however, miss an important backup strategy: you must keep important backups in a different location from your computer. The Loma Prieta earthquake should have been enough to convince everyone that even solid-looking buildings can be destroyed. Hundreds of office buildings that were not destroyed were still so unstable that the occupants could not go back and get their belongings or their data. People who didn't have backups watched as their computers and their backups were plowed under in unsafe buildings, destroying tens of thousands of work hours.

It really isn't that hard to keep your backups offsite. If you work in an office, take them home. Keep them in an area that is unlikely to be damaged by common house disasters like water; a metal filing cabinet should be fine. If you work at home, take your backups to a friend's house. Many people store monthly backups in safe-deposit boxes. You can buy fire-resistant chests for under $100 that will help prevent damage. Although these are not designed to prevent diskettes and tapes from melting, they are much more heat-resistant than standard filing cabinets.

MAKING BACKUP EASIER

One of the main complaints people have about backing up their data is how much time and thought it takes. (Of course, they don't mention how much time and thought it would take to recover from a disaster, or even a simple disk crash.) In the past few years, many hardware and software companies have remedied this situation by coming out with easier and cheaper backup methods. You don't have to look beyond the pages of this issue to find them in many advertisements.

The biggest boon to faster backups is a tape drive. You can back up an entire hard disk many times on a single tape cartridge. Although the tapes are not cheap, they are usually more cost-effective than diskettes. Backing up is simply a matter of popping a tape in the drive, running a program, and going away while the backup is in progress. Some systems even let you continue working while you are backing up, although the backup process usually slows down other work considerably.

Continued on page 64

Almost every story you read in newspapers about break-ins and data theft occurs on multiuser computers and networks. This has lulled many people who have single-user, un-networked PCs into a false sense of security.

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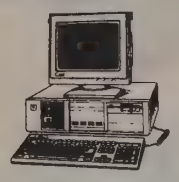

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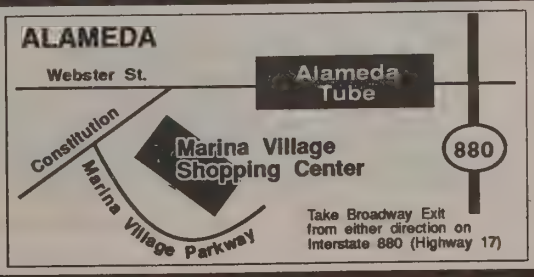

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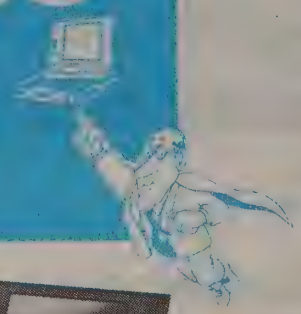

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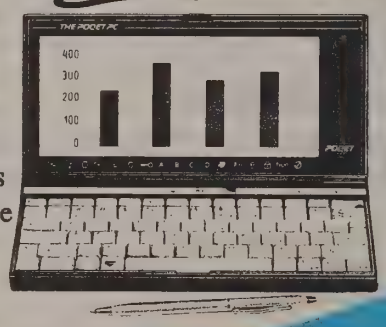

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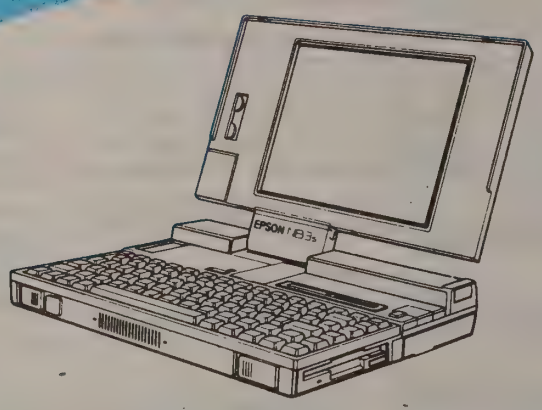

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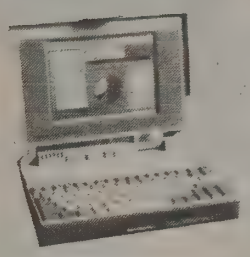

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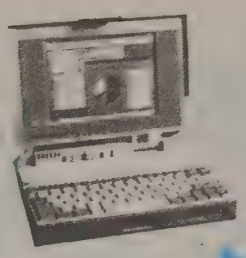

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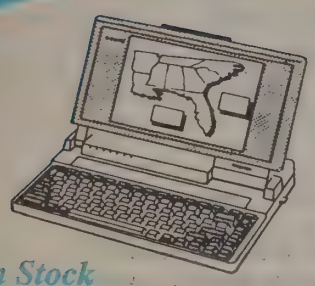

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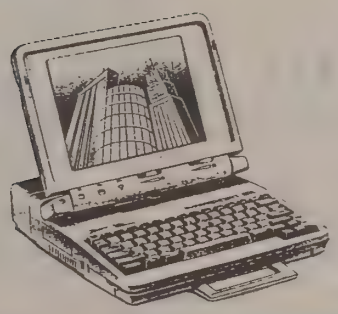

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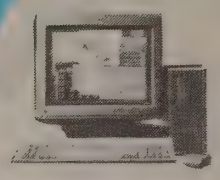

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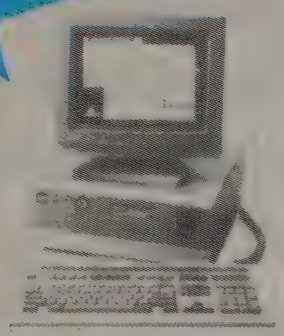

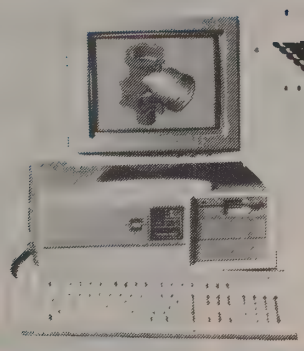

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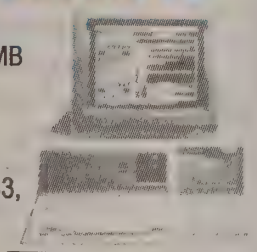

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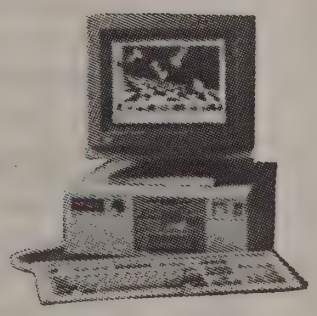

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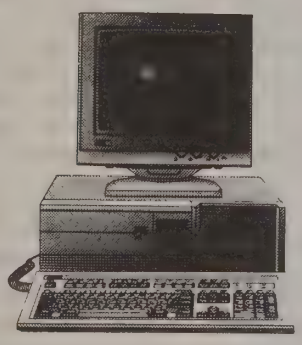

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Tutorials planned for Monday, March 25th, include:

Low-Cost Networking & Computer Bulletin Boards
Computer Communication & the Global Matrix
Federal Legislation Impacting Computer Use
Computer-Related Legislation Within States
Current & Proposed International Policies
How Computer Crime is Investigated
How Computer Crackers Crack
Information Security

Conference sessions on Tuesday-Thursday, March 26-28, include:

The Constitution in the Information Age
Computer-Based Surveillance of Individuals
Law Enforcement Practices & Problems
International Perspectives & Impacts
Electronic Speech, Press & Assembly
Access to Government Information
Law Enforcement & Civil Liberties
Trends in Computers & Networks
Personal Information & Privacy
Legislation & Regulation
Ethics & Education
Where Do We Go From Here?

Laurence Tribe, Harvard • William Bayse, FBI • Eli Noam, Columbia

Speakers & panelists include: Ken Allen • Sharon Beckman • Jerry Berman • Paul Bernstein • Sally Bowman • Russell Brand • David Burnham • Mary Culnan • Dorothy Denning • Peter Denning • Dave Farber • Cliff Figallo • David Flaherty • John Ford • Bob Gellman • Janlori Goldman • Mark Graham • Harry Hammit • Martin Hellman • Evan Hendricks • Lance Hoffman • Don Ingraham • Bob Jacobson • Mitch Kapor • Tom Mandel • John McMullen • Peter Neumann • Donn Parker • Ron Plesser • John Quarterman • Jack Rickard • Tom Riley • Lance Rose • Marc Rotenberg • Noel Shipman • Harvey Silverglate • Gail Thackeray • Robert Veeder • Willis Ware • Sheldon Zenner • *and many more.*

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Registration is limited to 600, primarily as *first-come, first-served* within each major interest-group.

Fees, if received:	*by* Mar. 15:	*after* Mar.15:
3-day Conference, 3 luncheons & 2 banquets	$350	$400
1-day Tutorials (1 or 2 half-day seminars)	$145	$195

For further details & registration applications, please contact:

Computers, Freedom & Privacy Conference Office
345 Swett Rd., Woodside CA 94062
CPSR: (415)322-3778 *fax:* (415)851-2814 *e-mail:* cfp@well.sf.ca.us
Conference Chair: Jim Warren 2.2

Continued from page 58

Tape drives are now becoming standard equipment on many large PCs. If you don't have a tape drive, you can buy one as an add-on to the computer. Typical tape drive prices start at around $300 for internal PC drives and $700 for external Mac drives. Drives that take higher density tapes are more expensive, but the tapes are usually around the same price.

Even if you stick to floppies for backup, software companies have made backup software almost trivial to use. The most popular PC and Macintosh programs do all the work for you after you set them up. They tell you which diskette to insert in the drive, when you need more diskettes, and so on. All major programs compress as they back up, reducing the number of diskettes you need and thus making the process easier to follow.

Once you have backed up all of your files and have a reasonable procedure to do so on a regular basis, you can start feeling more secure. It's good to test your procedure every so often to be sure that you're not doing something wrong. For instance, try to recover some known important files from last year and make sure that they are readable. If not, you need to immediately assess what you're doing wrong in your backup procedure.

Imagine that your office burned down and the next week you were called in for an IRS audit. You are much less likely to survive an audit if you have no paper or computer records at all than if you can get your old computer records from a backup.

WATCHING OUT FOR DATA THEFT

People who use multiuser computers or networks usually think of data theft as a more important security issue than data loss. Almost every story you read in newspapers about break-ins and data theft occurs on multiuser computers and networks. This has lulled many people who have single-user, un-networked PCs into a false sense of security. Even though programs that require passwords and scramble files are readily available for PCs and Macs, they are rarely used.

In order to get access to data on a single-user PC, someone must physically break into your office or home. This seems like a big barrier until it happens. The crime rate in California, like most other areas of the US, is steadily increasing. Computers have become a very common target of theft. Often, someone stealing a computer will not bother looking around the hard disk for information. Often, but not never.

An encryption program makes the data on your hard disk unreadable to anyone who does not have access to it. Usually, these programs require a password when you start up your computer in order to access the hard disk, or at least to access encrypted files. Some programs do not prompt you for the password until you open a

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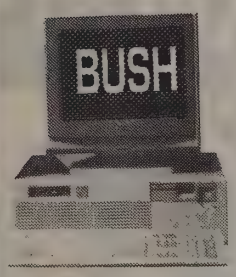

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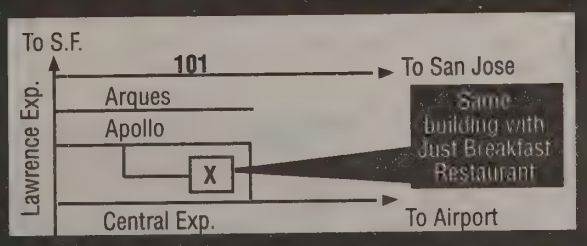

protected file. The basic idea is that the program will only unscramble the data once a password is given.

Most of these programs work at the operating system level so that you can use them with any application. Some applications have their own password protection schemes that can work on top of a password utility. Before you buy a password program, you should find out from its manufacturer whether or not it works with all of your applications. This is especially important on the PC, where there are many more ways for programs to interact badly with password programs.

If you're using an encryption program and your computer is stolen, it becomes incredibly difficult for the thief to look at your data. If you are prompted for a password at startup, he or she may not even be able to boot up your system. Even if you use a scheme that only prompts on protected files, the thief would have to try an extremely large number of combinations of passwords. Looking directly at the disk probably won't help either, since most encryption programs don't keep any password information on disk. Even if an analyst could read everything from the disk, nothing that was encrypted could be read since there was no way to guess the password (assuming you did a good job of choosing a password).

The most common way to circumvent an encryption program is to have a good guess about what the password is. If you write your password on a piece of paper and hide it, you can assume that there is a good chance it will be found. A good thief would know where to look for such a password. Even if you don't write it down, choosing an obvious password makes the encryption system almost worthless. Common bad passwords include your name, your partner's name, a child's name, the type of car you drive, and so on. A motivated thief might try a few hundred good guesses on your password, probably with an automated system.

PREVENT COMPUTER THEFT

It is unlikely that the thief will want to sit in your office trying all of the passwords. Even if all he or she wants is the computer and not your data, they will want to get out of your office or home as soon as possible. You can deter a thief from stealing your computer with a locked cable attached to some furniture or by anchoring the computer to a desk. Security kits are available from a variety of manufacturers.

A thief with a pair of industrial wire cutters can get around a cable-based system, although common thieves don't normally carry these around with them. The anchoring systems consist of a clamp attached to the bottom of the computer with a lock on the clamp adjustment. Although not perfect, anchor systems make it extremely difficult to steal a computer quickly.

If your major concern is financial loss from your computer being stolen (because you are good about backing up your data), you should be sure that your computer and peripherals are insured. If you work at home, your computer may not be covered by a homeowner or renter policy. Check carefully with your insurance agent to determine if your computer is fully covered. You can get a computer-specific policy from many insurers. A popular national agency for computer insurance is Safeware (800/848-3469). For example, Safeware will insure up to $14,000 worth of hardware and software for $129 a year, with adjustable rates for different amounts of coverage. ■

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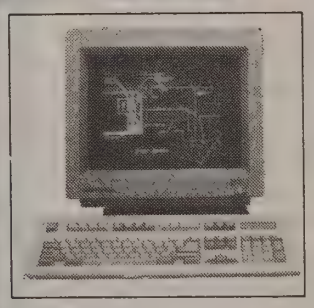

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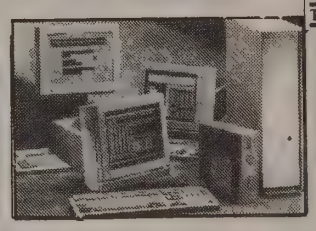

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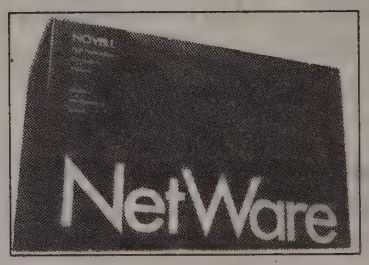

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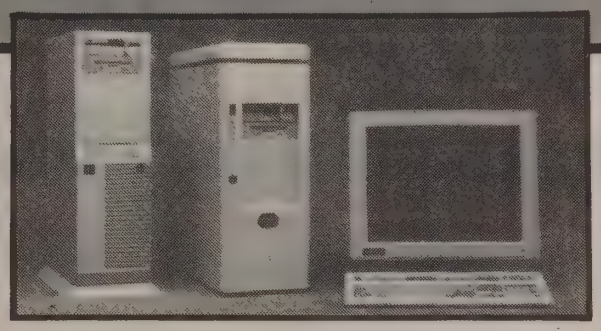

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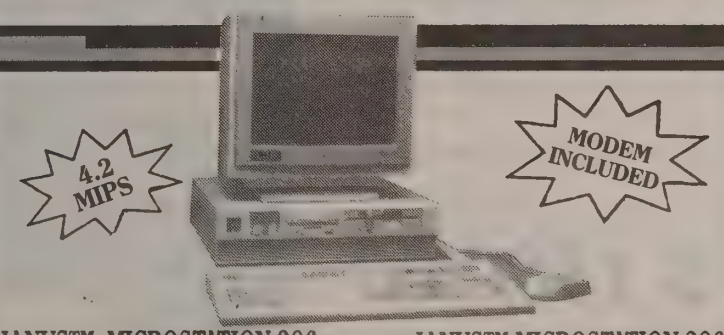

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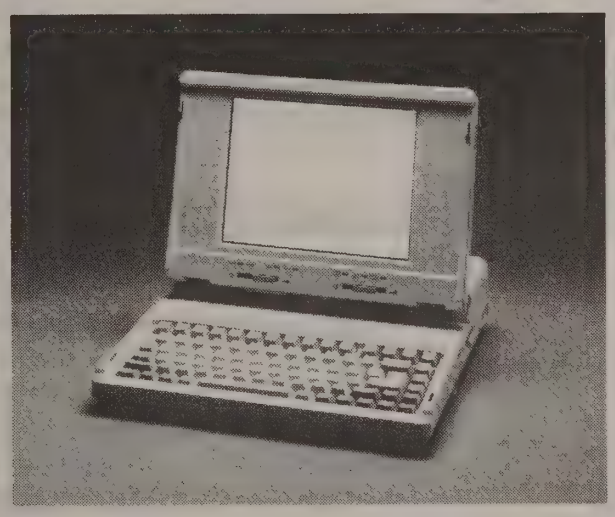

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Risk Assessment For Your Computer System

Murphy Was Right, So Be Prepared

BY MIKAEL BLAISDELL

Conventional wisdom says, "If it ain't broke, don't fix it."

While this is often sage advice, there is a definite danger in trusting it too far. It is all too easy to overlook a potentially serious problem simply because it is not sending immediate warning signals. The truly wise system manager or business owner will regularly analyze the operation to identify potential problems before they have a chance to "go critical"—and take action to prevent or to prepare for any such eventualities. The payoffs for this effort may often be subtle, but the total effect is a smoother, more effective business or computer operation. And, of course, you may just spot a potentially lethal problem in time to prevent a major disaster.

At a recent computer show, the applied-information director of a Fortune 500 company described a recent problem at the headquarters office. The file server for a network went down, and required some serious repairs. The data was safe (the director was a well-known fanatic about backups), but the server would be down until the following morning. Consequently three floors of people were given the rest of the day off, since without access to the server's data, no effective work could be done.

Corrective action was promptly taken to prevent a recurrence, of course, but the damage had been done. Now, in addition to the main server, there's a primary backup unit that's constantly updated, and a secondary backup kept off-line but ready to be used within an hour if the others should fail.

Assessing the impact of the server failure showed that the loss in productivity was far greater than the cost of the two complete file server units that were installed as a reserve. Besides the obvious losses due to sending the staff home, the intangible effects of the users' general loss of trust in the system will take some time to correct.

REALIZING THE DANGER

There are countless tales of such events. All industries have a rich tradition of "war stories," an ongoing oral history of winners, losers, sudden opportunities or crises, new innovations in technique, practice or policies, etc. Buried in this accumulated body of knowledge are various warnings of real or imagined problems, contributed by those who were involved in some way.

Like the "Here there be Dragons" warning sometimes seen on ancient maps, these stories should be given careful attention. Every disaster you hear about through the grapevine should spark a quick thought: "Could this happen to me?" If the answer is yes, you will want to take some more time in determining what needs to be done about the situation.

One of the most common pitfalls is the danger in over-reliance on a single resource. Among consultants, there is a technique called "the beer truck test": when visiting a client, point to a senior person and say to the owner/manager, "That person just stepped in front of a speeding beer truck, and will not be coming back to work. What will you do to continue your business without him/her?"

This is a clear example of the dangers of putting all your eggs in a single basket, and it can be found every day in some form in virtually every business, organization or activity. Despite the availability of "key employee" insurance policies and other measures, the beer-truck test continues to have its predictable results.

The "indispensable resource" doesn't have to be a person, either—it may also be found in your computer system, as in the tale of the failed network file server. To an ever-increasing degree, we have become dependent upon, if not downright addicted to, the continued availability of our computers in nearly every aspect of our business operations. This over-reliance did not happen overnight; it has been quietly growing for years, unchallenged and unperceived. While Band-Aids have been applied to various aspects, usually after some sort of disaster, the overall scope and potential effects of this condition have rarely been assessed on a company-wide basis. As a result, our computing resources may be minefields of unpleasant surprises, just awaiting an opportunity to occur. This state of unawareness can be painfully expensive in the long run, for the level of addiction or reliance tends only to increase.

The first lesson to be learned and relearned is that Murphy was right—anything that can go wrong, will. One of any manager's principal responsibilities is preparation for the problems and upsets that inevitably will occur. Proper preparation involves knowing your resources and constantly assessing the risks and potential for problems. In practice, assessing real or potential risks will tell you a lot

After you have identified some problem areas, the next step is to assess the costs involved. It doesn't make much sense to spend a lot of money protecting a resource that is easily replaced or that has little impact on your operations.

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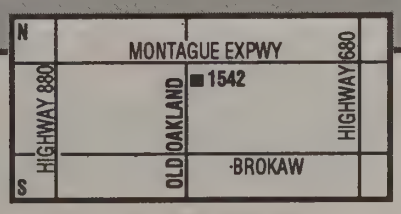

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about your resources, and testing your resources will often reveal useful information about potential problems. In the example of the file server, asking, "What would happen if the file server were to totally fail?" might have revealed the degree to which the company had come to rely on constant access to the data. At the same time, asking, "How long would it take to completely reload the server from the backups?" might have shown that everyone was assuming the server hardware would always be available.

HUNTING THE HAZARDS

The greatest single source of disasters, large and small, is created by the common assumptions we all make and rarely think to question. Like blinders over the eyes of a carriage horse, assumptions are used to focus our thoughts toward specific areas. Just as the horse can't remove the blinders, we often need help in seeing the assumptions we make and take for granted. Here a consultant can be of great value; so can a coworker who has different responsibilities (and different assumptions). The most effective assistant is someone who doesn't have the same point of view or assumptions that you do, who comes from a different working environment—but whose judgment you trust.

On the other hand, too much awareness of the risks can scare or demoralize people or companies, and can be just as dangerous as taking no precautions at all. Keep a balance between the two extremes. This issue will come up again during the corrective-action phase of the work—it is easy to be so protective of a resource (especially a computer system) that no one can make effective use of the resource at all.

The hunt begins by identifying assumptions, then testing those "givens" for accuracy. The process can actually be fun to do as a group, to divide up into teams of problem-solvers and challengers, with a referee to keep the challenges reasonable and to rule on the effectiveness of the "solutions" posed by the problem-solvers. A recorder is also useful, to make notes of challenges that seem to hit uncomfortably close to home, and to keep track of proposed solutions.

Here's an example of a potentially dangerous assumption. A small business discovered (the hard way) that an old computer system had become totally obsolete. The hardware manufacturer had gone out of business; the author of the software was also gone, and there was no one around who knew very much about the system. The computer had performed faithfully for some years, showed no signs of problems, yet posed a serious risk to the business. The owners had *assumed* that if and when it broke down, it would be repaired as in the past, not realizing that the repair services were no longer available at all.

Fortunately, the breakdown that did occur was minor, and by chance they found someone who could tell them what to do about it temporarily, but the shock caused by the sudden awareness of their vulnerability was considerable.

Along with testing your assumptions, you or your consultant should be looking for critical areas or operational parts of the business. Follow the work flow, pretending to remove one element after another. As each step is challenged, note what would have to be done in order to replace the defective component or work around the problem.

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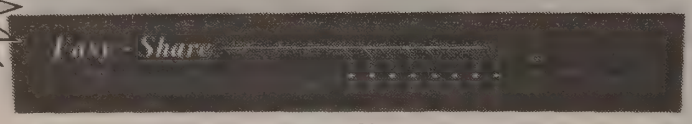

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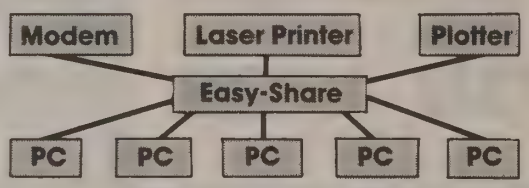

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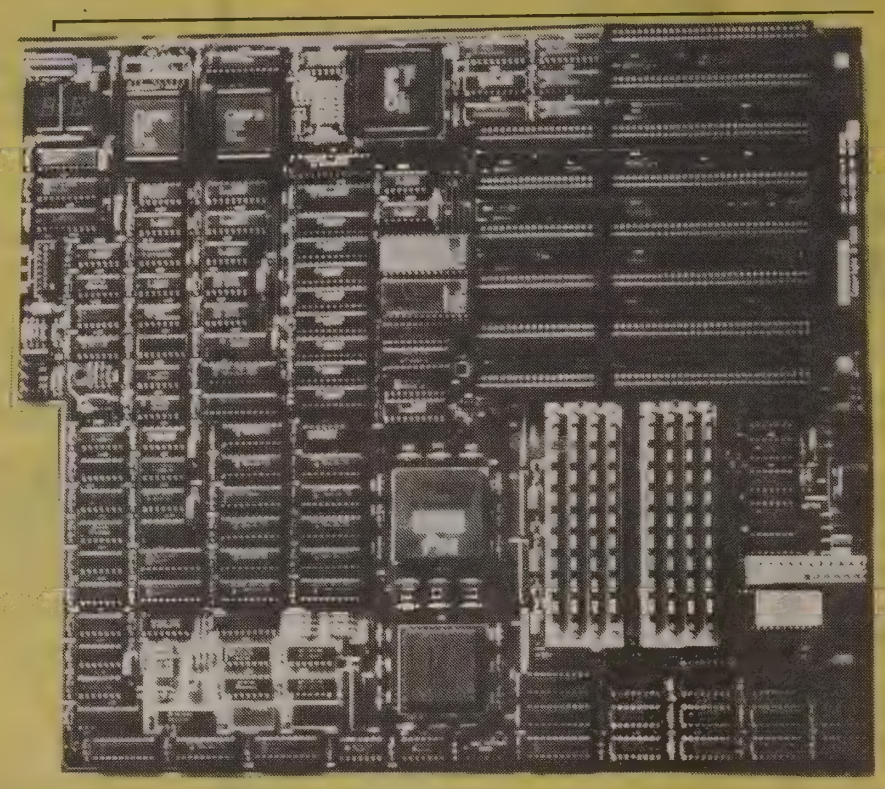

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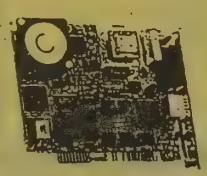

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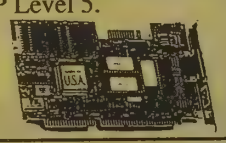

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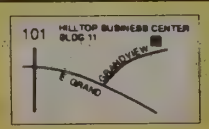

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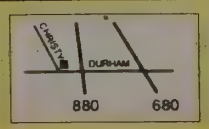

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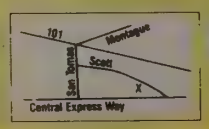

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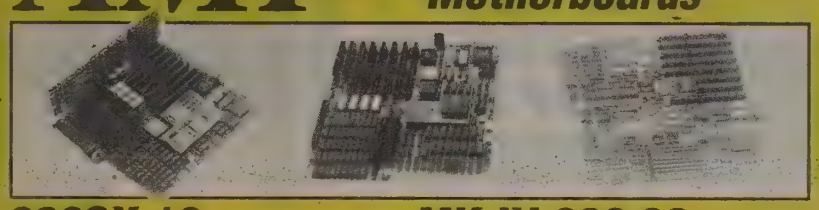

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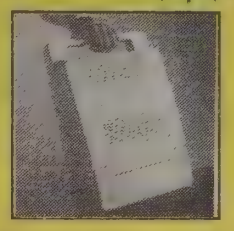

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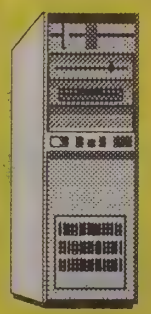

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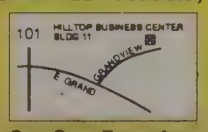

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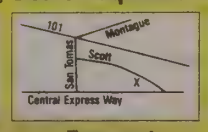

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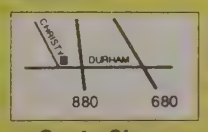

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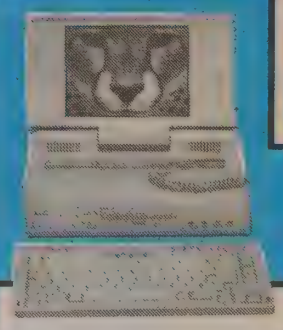

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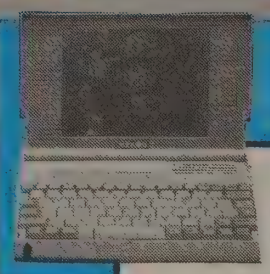

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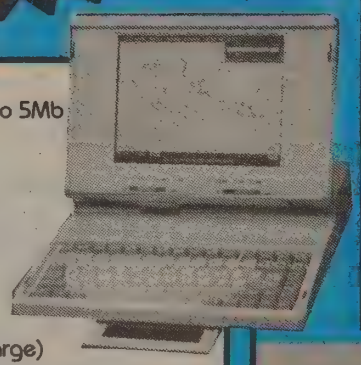

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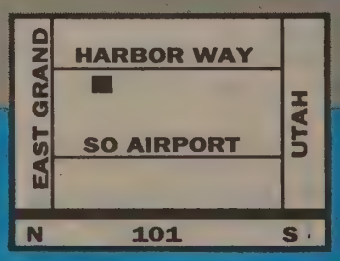

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Are there procedures or operations that only one person knows how to do? If so, what happens if that person leaves or meets the beer truck? Is there a workaround that will enable the operation to keep going? What effects will using that workaround solution produce? What assumptions are you making about the workaround? What is being taken for granted?

Note that this kind of what-if thinking can often identify unnecessary steps or suggest more efficient procedures—but be careful to test any new "fixes" before placing too much reliance on them. New assumptions can be just as dangerous as old ones.

COST ANALYSIS

After you have identified some potential or real problem areas, the next step is to assess the costs involved. It doesn't make much sense to spend a lot of money protecting a resource that is easily replaced or that has little impact on your operations. For a lot of potential problems, you may simply have to decide what you'll do if they happen. For example, if one workstation were to fail or otherwise become unavailable, the workload might easily be shifted to an alternate station. The cost of a backup workstation may not be justifiable—or it may be absolutely required, depending upon how critical the operation is at that point. You won't know until you take a careful look.

Another illustration of the cost analysis process can often be found in the backup procedure for the computer system. How often backups are made is frequently a touchy point, especially if the system has to be "down" during the process. The value of the lost productivity during the down time has to be assessed against the risk of lost data if the system should fail. Even if the system doesn't have to go down in order to do a backup, pay careful attention to the intervals. Assess the costs involved, not only for a presumed loss of everything since the last backup, but also the costs if one or more of those backups should prove invalid and/or unusable. You should also do an absolute worst-case scenario, assuming a total loss of everything (data, hardware, etc.).

The end result of the cost analysis should give you some valuable information to help you decide on a means of prevention or reaction. At the same time, take those projected losses and compare them against your insurance coverage. You may discover that your computer or other coverage is very low or nonexistent.

Cost assessment should always, if at all possible, involve the accounting depart-

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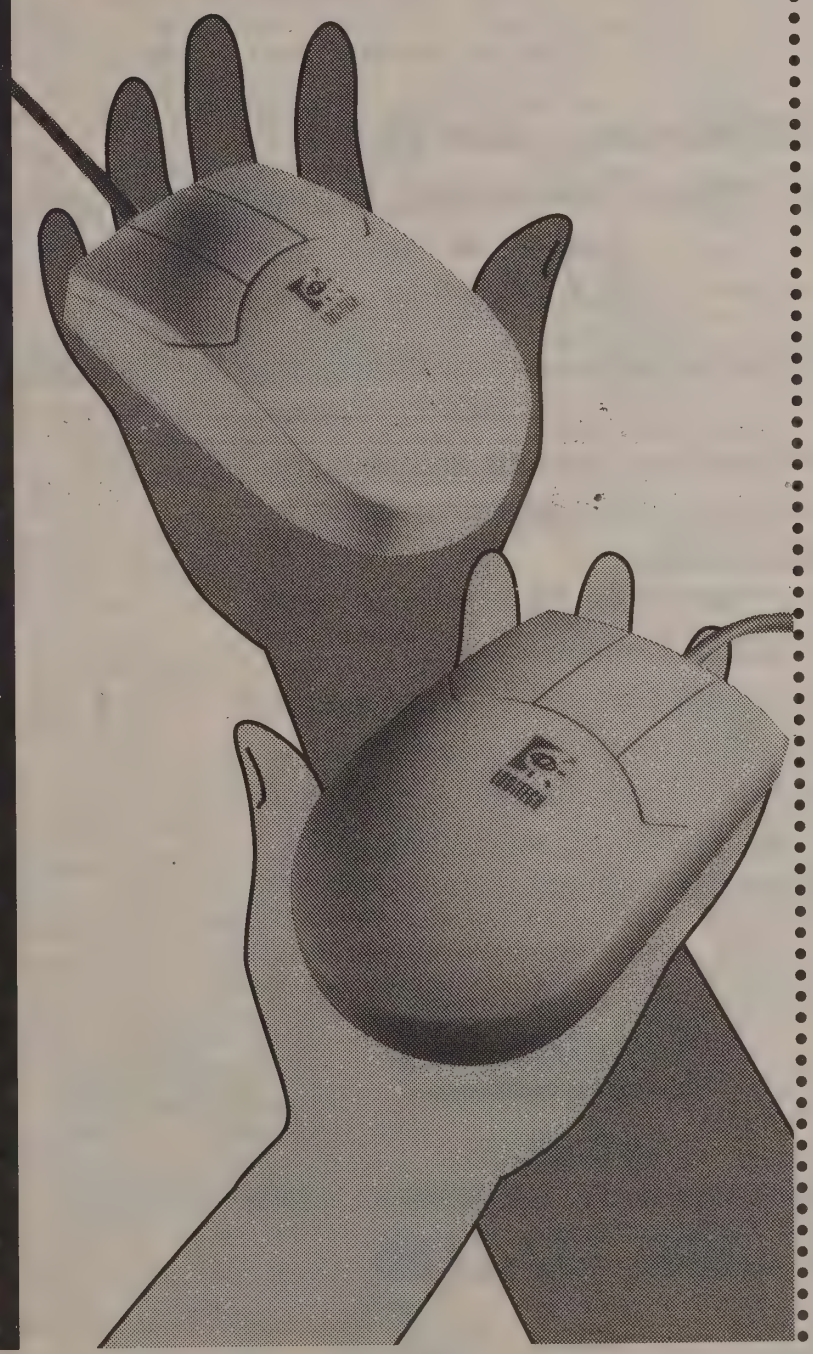

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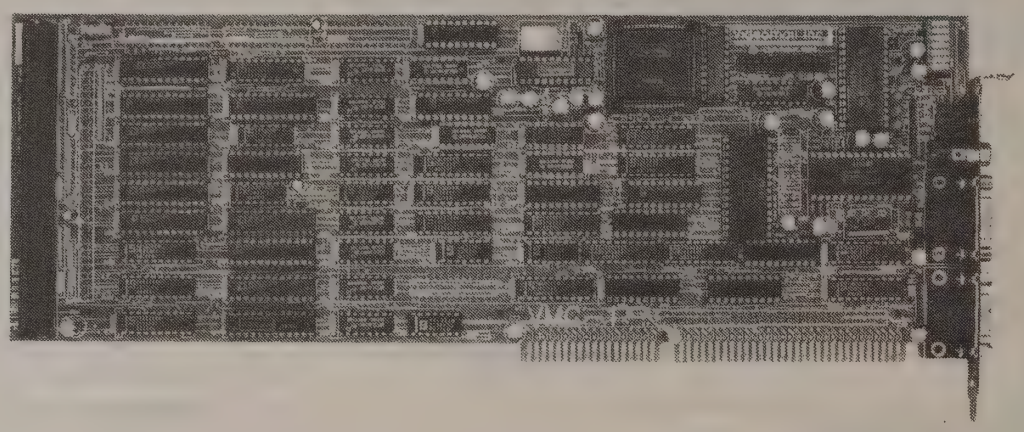

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ment. Even if you don't have time for a full research project, and are doing a quick "ballpark" estimate, it helps to have the numbers and the estimate process checked. At the very least, the accounting people may spot some of your hidden assumptions, or point out related costs that aren't immediately apparent to non-financial managers.

THE OUNCE OF PREVENTION

Knowing that you are vulnerable to a particular situation or problem is often the major factor in reducing its impact if/when it occurs. For example, realizing the degree to which the company operations depended upon the continued availability of the network file server enabled the Fortune 500 company to reduce the risk by providing alternate backup servers.

There are usually many potential solutions to any given problem. Your choice of an appropriate method or solution will depend upon a number of other factors, including cost, effort, impact, time, etc.; the decision should be made with care. A "cure" or "prevention" that takes too much time or effort is unlikely to be done, and can create its own hazard. After you've made the decision, remember to periodically re-examine the issue for changes in the conditions.

The last, and perhaps most important, part of this process is to test your decisions as much as possible. If you install a pair of file servers as ready backup units, test them in actual operation. Find out how long it takes to switch over, and what the effects are of that action. Test your backup copies of data in the same way, by reloading them on the computer. Just assuming that your backup is always going to be effective, or that the data can be restored successfully without careful testing is unfortunately very common—and exceptionally dangerous.

THE PAYOFF—MANAGING THE RISK

The rewards for a regular and consistent risk analysis process come in a variety of ways. Some are easy to measure, others are subtle, but the overall effect is very apparent over time. Besides improving your operating procedures, you can greatly increase the depth of your knowledge about the business and its components and resources. This knowledge, in turn, enables the business or system to be run more smoothly, and to grow more easily. The obvious savings from the disasters that didn't happen, while perhaps the initial impetus for your efforts, may turn out to be the least of the benefits to be gained. ■

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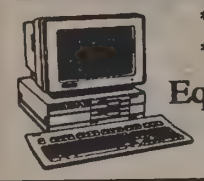

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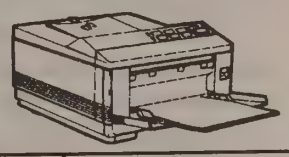

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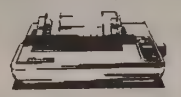

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The Powerful, Easy-To-Use, Portable Database

The Impossible Dream?

BY ED KAHN

Recently I got a phone call from a software manufacturer who wanted to demonstrate a new database specifically designed for the laptop and notebook computer crowd.

The demo was, indeed, instructive. The most interesting thing about the demonstration was not the program itself, but the lesson it taught me—some applications are simply not easy to use.

Databases, I feel, fall into this category. I've longed for a really simple database for years, but, alas, there seems to be an inherent contradiction between a powerful database and real ease of use.

I've always looked for a database manager that lets you create simple forms, then reorganize the data so you can print a custom designed report—but I've never found such a product. If I want, for instance, to create a really simple database that lists my record collection, I am forced to learn a fairly complex program. Even integrated products like Microsoft Works require you to learn the guts of a database program.

Unless you'll use the program repeatedly, you're much better off buying a customized program to organize specific kinds of data. That's why there are so many tailor-made programs like address books, record collection catalogs, recipe managers and the like. The developers of these programs have simply created programs that do a specific job easily. I remember, for instance, trying to create a mailing list and phone directory with dBASE years ago on a CP/M computer. I got the job done, but not easily. And when I wanted to modify the list six months later, I had to nearly start from scratch.

PERSONAL R:BASE

So I was intrigued when the representative from Microrim phoned to say he wanted to demonstrate a new database manager called Personal R:Base ($299, with an introductory price of $99), a product designed for users like me.

He explained that this was a program designed for users who didn't need networking or a programming language. He went on to explain that the program was organized by pull-down menus and had help screens at every turn to guide you through the creation and use of a database. Furthermore, he went on, the program was really powerful. It could import from dBASE and other database managers and was a true relational database, which meant that it packed a lot of power and allowed you to link forms together.

It sounded perfect. And in many ways it is. It was designed to run on 512K so it would run on almost any modern computer. This was a product made for people who had been previously organizing their material on spreadsheets or even word processors.

When the demonstration began, the representative loaded the program on my computer, which was a breeze. Then he began to go through the program to illustrate its power. Not only could you create databases, but there were a number of built-in applications already in place. These included a mailing list, an appointments calendar, a home inventory, a checkbook manager and a recipe and shopping list program.

But when I asked him to create a simple application I had in mind, things got complicated.

My project was indeed simple: I wanted a database to help me keep track of mail order purchases. It was to include the company ordered from, date ordered, catalog number for the item ordered, date received, date returned and so forth. The Microrim representative was able to create the application, but it turned out to be a good deal more complex than I had anticipated.

As I asked how you could modify the report to look the way I wanted, he began consulting the documentation—which is nearly an inch thick. In the end, there were still several things we simply didn't have time to cover in this sample run-through.

This is not in any way to detract from the power or elegance of Personal R:Base, which is both powerful and elegant. But it serves to illustrate the difficulty of coming up with a program that is powerful, elegant and also simple.

Simple is a relative term. Compared to other databases out there, Personal R:Base is simple and powerful. But compared to the publicity that preceded the program, it is complex.

It is a good deal easier to use and learn than the competition in its class. It is a superb program with an excellent tutorial. One of the interesting things about the tutorial is that you can access it even from inside an application. So if you get stuck, you can stay where you are in the program and go into the tutorial and then return to your place.

But to illustrate the complexity of this simple program, there are eleven sections in the tutorial. If you take the average time recommended, just working through the tutorial will take you something over five hours! Hardly so simple that it is intuitive for the novice.

If you need a powerful database manager, by all means take a look at Personal R:Base, but be prepared to spend some time learning and customizing it. ■

Personal R:Base was designed to run on 512K so it would run on almost any modern computer. It's made for people who had previously organized their material on spreadsheets or even word processors.

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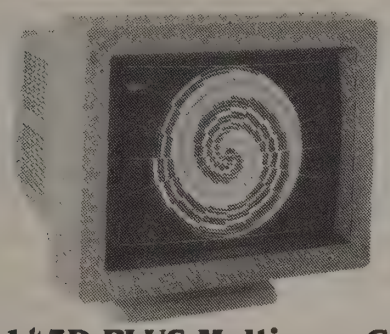

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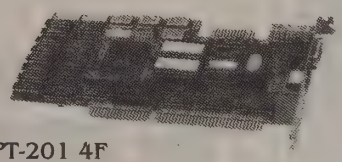

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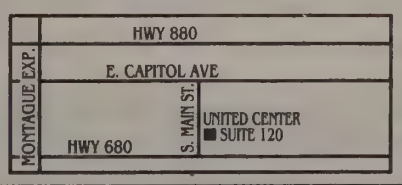

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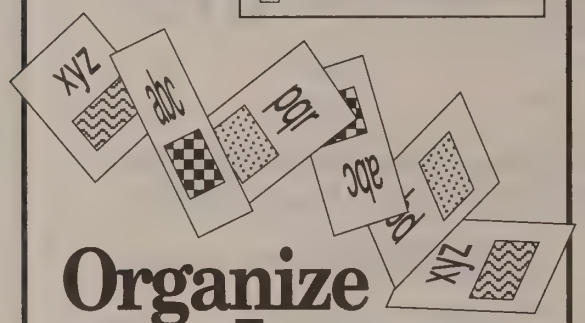

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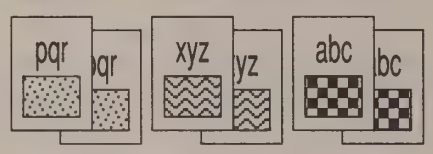

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BUSINESS SOLUTIONS

Computer of the Month

GRiD 1810

One of the most interesting of the recent batch of niche machines is the GRiD 1810, which specifically addresses a corporate market that has many laptops in a pool of machines. The 1810's most distinguishing feature is its removable hard disk.

The concept and design are straightforward. On the right side of the computer is a slot into which a 20Mb hard drive fits. After completing a work session, the user removes the hard disk and stores it until the next use. Therefore, a company pool can have a few machines and a lot of hard disks so that every user will have his own configuration and data at a fraction of the cost of individual portables for every user. Additional hard drives cost $795.

Taking advantage of the GRiD 1810, a company pool can have a few machines and many hard disks, so that every user will have his or her own configuration and data at a fraction of the cost of individual portables for everybody.

There are a number of ways in which this concept can be applied. If a company has GRiD desktop machines with the appropriate adapter, the removable hard disk can be used in these machines as well as the 1810. This means that a user can literally take his or her desktop configuration with them into the field. It also means that if a company has offices in different towns, the employee can take along his or her hard disk, which weighs almost nothing and takes up no more room than a pack of cigarettes, rather than lug along even the lightest of computers and accessories. Although you can't work on a plane, most laptop users actually use their machines only in a few locations; most of the talk about working in the air seems to be advertising hype.

The basic GRiD 1810 is a 6.7 lb. machine with either a backlit or ambient light screen measuring about 10" diagonally. The backlit screen costs an additional $500. The computer is powered by a V20 chip running at 10MHz. It comes with a standard 1Mb of RAM, but can be ordered with 2Mb for an extra $595.

One thing that keeps the machine light is its lack of a floppy drive, but GRiD makes it easy to attach its external floppy. You merely remove the internal rechargeable battery and replace it with a peripheral cartridge ($150) which then allows you to attach either a floppy drive—of which there are a number of models and capacities designed to suit your specific needs—or a tape drive. In this way, software can be installed and you can go on the road without the need to carry anything other than the computer with its hard disk.

The machine comes with both LapLink and DOS installed in ROM. This allows you to transfer applications and data to another computer through the supplied cable and eliminates the need for a floppy drive. I must confess that I still prefer the LapLink that I install from disk because I can make faster transfers by using the parallel port, but the version that comes with the computer is certainly convenient.

All of the other accessories, such as a 2400 baud MNP modem and carrying case ($140), are also available. While this computer is a pleasure for anybody to use, it really makes sense in the corporate setting for which it was designed.

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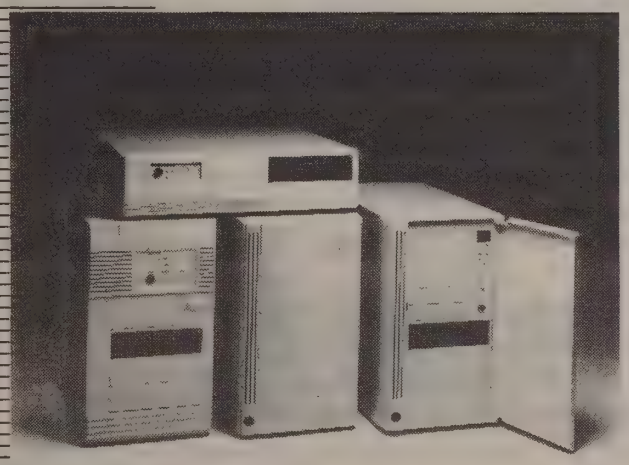

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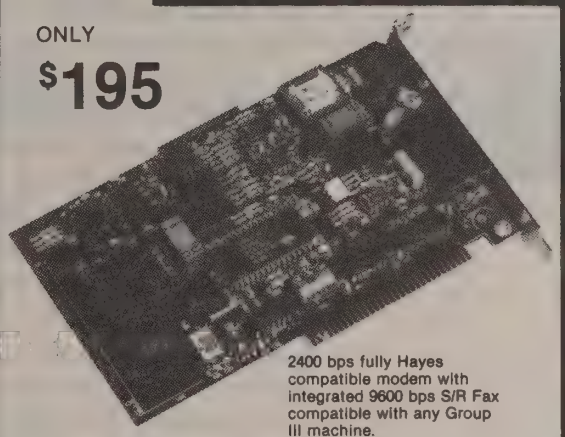

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SCO UNIX 2.0

What 386-Based UNIX Should Be

BY BENNETT FALK

Norman O. Brown attributed the Latin phrase "Nihil non iterum est" to Tertullian and promptly rendered it "Nothing happens for the first time." This is a sentiment that sounds odd to anyone who has dabbled in commercial software. The software world owes more to Henry "History is bunk" Ford than to Tertullian. In the knuckles and know-how world of software, we are encouraged to imagine that there are no second chances, and that things happen once or not at all. We tend to ignore version 2.0, and most of the time we can get away with that.

Every once in a while, however, the second version of something is more noteworthy than the original, and the latest version of UNIX from the Santa Cruz Operation, UNIX System V/386 release 3.2, version 2.0, is a candidate for this sort of fame.

UNIX

Functionally, this is the same version of AT&T UNIX (System V, Release 3.2) as its predecessor. The new release boasts the expected complement of bug fixes and an expanded list of copyright notices from vendors who have contributed components to the new system.

Two features of Version 2.0, however, make this a very important software release: the inclusion of the "korn" shell (ksh), and performance so dramatically improved that SCO UNIX version 2.0 may well offer the best performance of any UNIX product for 386-based hardware on the market today.

BENCHMARKS

While 2.0 is the same version of UNIX as its predecessor, its performance in benchmarks indicates that a lot of things have changed beneath the surface. The UNIX kernel for SCO's 3.2.2 system is still quite large (about 700K on the system tested), yet its performance is comparable to the performance of SCO XENIX, the lean, utilitarian implementation of UNIX for personal computers based on Intel processors.

Tables 1-4 show the results of running a modified version of the *Byte* UNIX benchmarks (first published by David Hinnant in *Byte* in 1983) on SCO XENIX and two versions of SCO UNIX. In each case, the figures presented are the averages of ten iterations of the whole test suite.

The tests that were run fall into four categories. The CPU intensive tests measure speed of computation ("sieve"), system call efficiency ("scall"), looping efficiency ("loop"), and the overhead involved in using function calls ("fcalle") in place of simple assignments ("fcalla"). The disk intensive tests measure disk read ("dread"), disk write ("dwrite") and pipe throughput ("pipes"). The "shell" test measures the system's multiuser capacity by running up to six concurrent sessions. Finally, the time required to compile the C source code for the other tests is included as a general measure of compiler efficiency.

All the tests were run on the same computer, a 16MHz Wyse 386 PC with an 80287 math coprocessor, but since the original XENIX measurements were made, the configuration has changed to keep up with the times. For the XENIX tests, the computer featured 2Mb of RAM and a 60Mb hard disk. For the tests of SCO UNIX 1.0, the machine was equipped with 6Mb of RAM. In testing SCO UNIX 2.0, the 60Mb hard disk was replaced with a 150Mb disk on a SCSI controller.

The tests show SCO UNIX Version 2.0 in a very favorable light. In almost every test, its performance is better than that of version 1.0, and in most tests it compares favorably with the XENIX system's performance. The compiler tests show the system running particularly efficiently on repeated compilations. In executing the multiuser tests, the new version differs from XENIX by less than two tenths of a second per user, and its single-user speed is excellent.

There are some anomalies. It is not clear why the sieve program ran more slowly under version 2.0 than under either version 1.0 or XENIX. The disk I/O tests show an odd performance imbalance between writing and reading that is just the reverse of the imbalance in XENIX's performance. Overall, however, everyone should benefit from 2.0's performance enhancements: business applications should be more productive and the system itself will simply be more fun to use.

THE KORN SHELL

The other big attraction in the new version of SCO UNIX is that the Korn shell (ksh) is bundled with the system. In UNIX, a "shell" is a command line editor and interpreter that allows users to run programs and provides a rudimentary programming language. The

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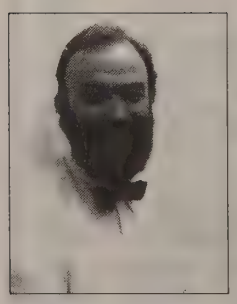

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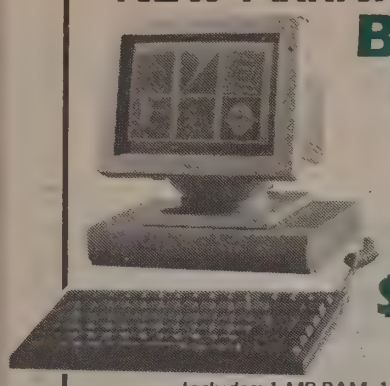

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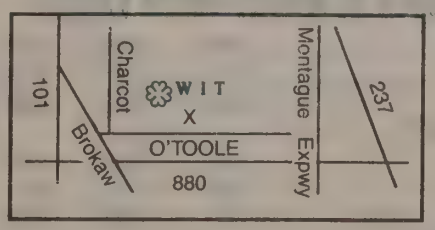

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UNIX shells provide the system's basic user interface.

For most of the history of UNIX, two shells have been available: the Bourne shell (sh) from AT&T and the C shell (csh) from Berkeley. The Bourne shell has a reputation for being terse and efficient; the C shell offers more conveniences, such as command aliasing, a history function to recall, edit and re-execute previously executed commands. In general, scripts written for the Bourne shell will execute more quickly, and scripts written for the C shell will be easier to read.

In the Korn shell many of the conveniences of the C shell (and a few novel ones besides) are incorporated into a shell that can run Bourne shell scripts. Access to these facilities owes more to the Bourne shell's syntax than

SCO UNIX version 2.0 may well offer the best performance of any UNIX product on the market today for 386-based hardware.

to that of the C shell, so C shell users already aware of the power of these features will have to learn a new set of conventions for creating aliases and managing a history list of commands.

The great boon of the Korn shell is that it implements for System V a set of "job control" commands very much like those available in Berkeley UNIX. Job control is the ability to shuttle jobs back and forth between foreground and background, and the Berkeley implementation (reproduced here in the Korn shell) is simple and intuitively satisfying. The ability to control multitasking from the command line opens up new possibilities for the way people use UNIX.

The Korn shell's job control features depend on the operating system's cooperation, and the Korn shell has been ported to a number of UNIX versions that do not support job control. Fortunately, version 2.0 of SCO UNIX has job control support, and of the three shells provided with SCO UNIX, only the Korn shell exploits job control.

In addition to job control, the Korn shell has command aliasing and command history management. The functions for editing the command history list emulate the command sets of two popular editors ("vi" and "EMACS") available for UNIX. This is different from the facilities of either of the other two shells, but it more than repays the effort to learn another set of commands.

Among UNIX users, shell preferences, like editor preferences or even operating system preferences, can be a matter of almost religious intensity. Not surprisingly, the development of shell programs for UNIX proceeds more or less dialectically. Optimists will see the Korn shell as a synthesis of the best features of the Bourne and C shells; cynics will see it as a "sour grapes" response to the C shell from AT&T. In any event, history moves on, and so far the learning curve is not so long that we miss much.

Finally, SCO UNIX 3.2 Version 2.0 is a good example of what UNIX is supposed to be: a fast, versatile operating system. It would be a shame to miss it just because you don't trust any numbers larger than 1. ■

TABLE 1: CPU INTENSIVE TESTS

	xenix 2.1 2MB	unix 3.2 6MB	unix 3.2.2 6MB
Executing fcalle			
	0.34	0.5	0.32
	0.2	0.2	0.2
	0	0.05	0
Executing fcalla			
	0.13	0.25	0.12
	0	0	0
	0.01	0.02	0
Function Call Overhead	0.21	0.25	0.20
Executing loop			
	1.8	2.19	1.91
	1.7	1.7	1.8
	0.03	0.1	0.04
Executing scall			
	2.45	3.85	3.04
	0.25	0.55	0.32
	2.13	3.15	2.65
Executing sieve (100 iterations 1899 primes.)			
	9.05	9.48	10.42
	8.9	9.37	10.28
	0.04	0.05	0.03

TABLE 2: DISK INTENSIVE TESTS

	xenix 2.1 2MB	unix 3.2 6MB	unix 3.2.2 6MB
Executing dwrite			
	0.33	0.88	0.5
	0	0	0
	0.25	0.3	0.24
Executing dread			
	0.65	0.89	0.35
	0	0	0
	0.23	0.35	0.26
Executing pipes			
	1.23	1.7	1.28
	0	0	0
	0.53	0.74	0.62

TABLE 3: MULTI-USER TESTS

	xenix 2.1 2MB	unix 3.2 6MB	unix 3.2.2 6MB
Shell 1			
	2.47	2.38	1.83
	0.08	0.1	0.1
	0.6	0.72	0.58
Shell 2			
	2.18	3.81	2.66
	0.18	0.22	0.19
	1.2	1.39	1.11
Shell 3			
	3.45	5.42	3.76
	0.18	0.35	0.34
	1.86	2.01	1.62
Shell 4			
	3.86	6.71	4.59
	0.31	0.53	0.43
	2.32	2.7	2.29
Shell 5			
	4.77	8.33	5.74
	0.38	0.61	0.6
	2.91	3.38	2.9
Shell 6			
	5.71	9.7	6.71
	0.48	0.76	0.68
	3.53	4.12	3.6

TABLE 4: COMPILER TEST

	xenix 2.1 2MB	unix 3.2 6MB	unix 3.2.2 6MB
Compiling dwrite.c			
	4.76	5.7	4.1
	1.11	1.19	1.14
	1.39	1.42	1.18
Compiling dread.c			
	3.4	4.97	3.45
	1.11	1.25	1.17
	1.12	1.35	1.15
Compiling fcalle.c			
	2.81	3.99	2.6
	0.7	0.54	0.54
	0.99	1.17	0.86
Compiling fcalla.c			
	2.62	4.04	2.58
	0.57	0.46	0.45
	1.03	1.13	0.84
Compiling loop.c			
	2.83	4.41	2.92
	0.65	0.57	0.57
	1.07	1.32	0.98
Compiling pipes.c			
	3.1	4.68	3.16
	0.94	0.91	0.86
	1.08	1.41	1.02
Compiling scall.c			
	2.73	3.91	2.51
	0.62	0.45	0.41
	1.02	1.15	0.82
Compiling sieve.c			
	3.01	4.79	3.29
	1.07	0.99	0.96
	1.04	1.37	0.9

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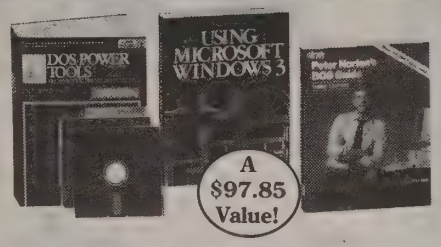

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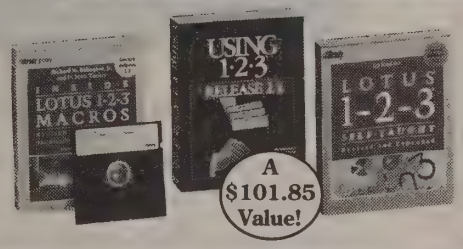

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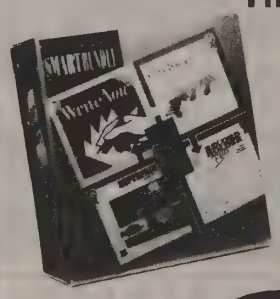

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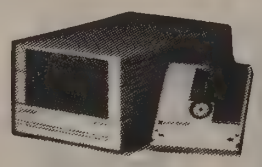

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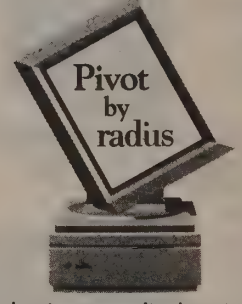

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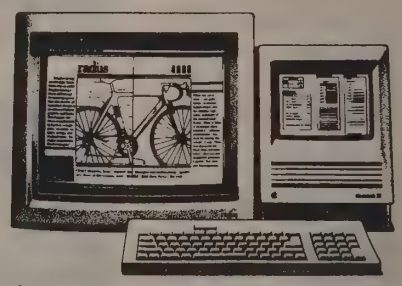

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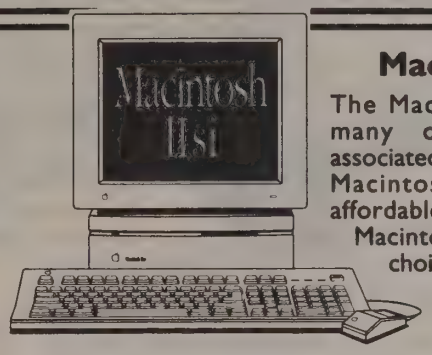

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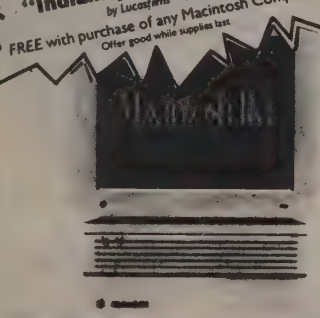

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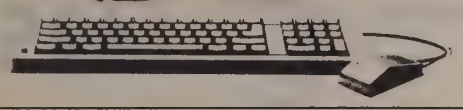

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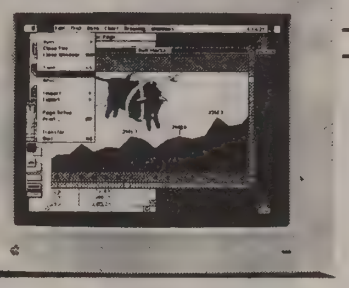

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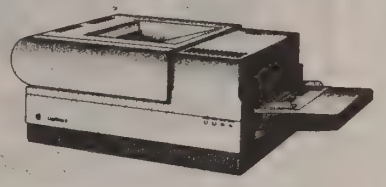

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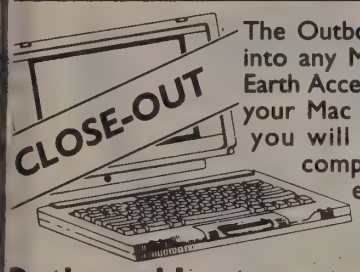

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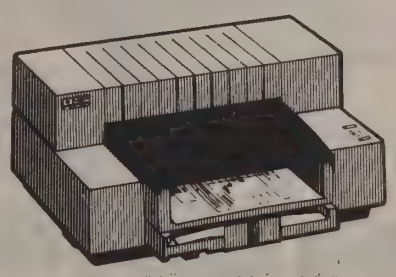

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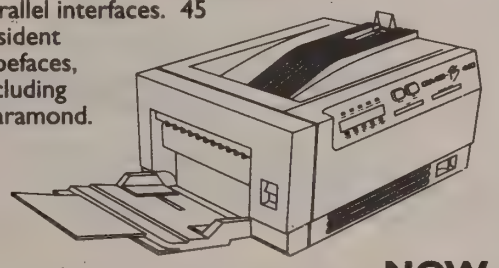

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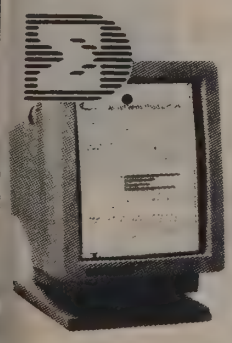

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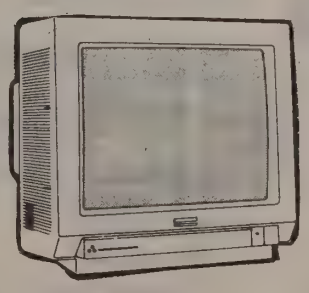

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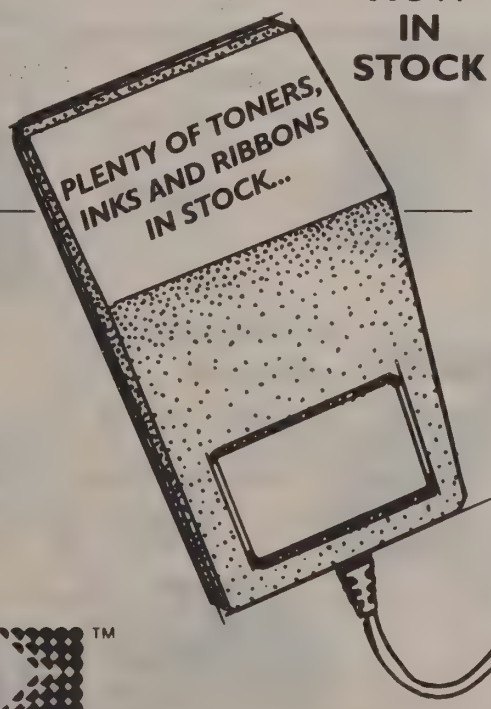

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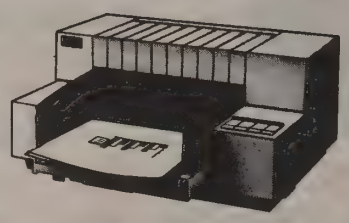

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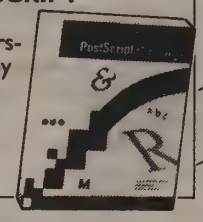

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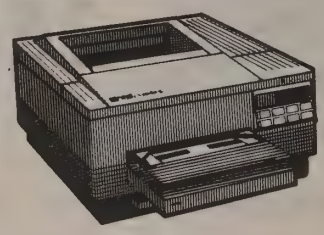

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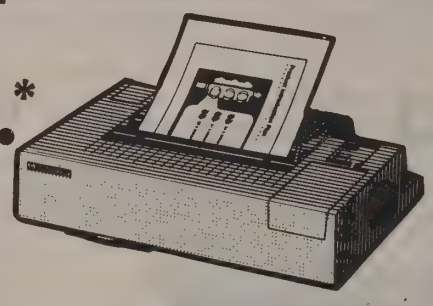

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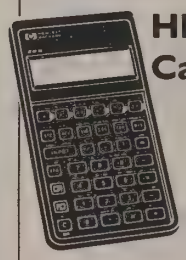

HP 10B Business Calculator

All the essentials for business.

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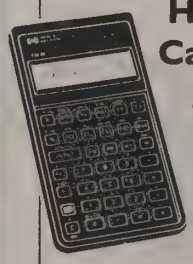

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Take the lead with HP's best financial calculators.

• Complete set of financial functions
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Come see it today.

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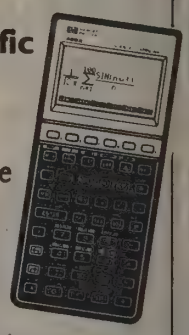
HP 19BII Financial Calculator..... 149.

HP 48SX Scientific Expandable Calculator



Power-users— take the lead with the new HP 48SX!

• Over 2100 built-in functions
• HP EquationWriter application
• Graphics integrated with calculus.

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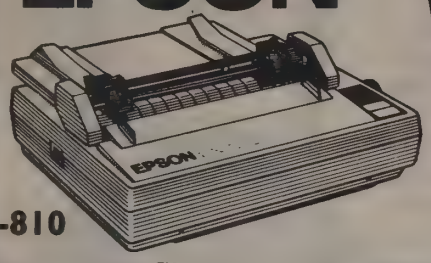

X-810

) pin • SmartPark™ paper handling • 200
'S super draft • 30 CPS
LQ • High resolution
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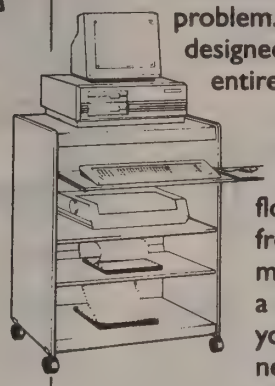
179.

LQ-1010

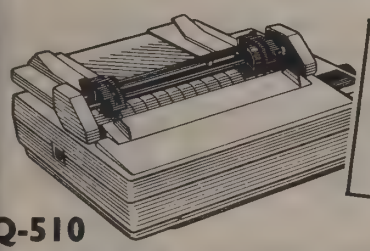
• 180 CPS draft, 60 CPS letter quality • 24 pin, 360 x 360 dpi graphics • SmartPark™ and SelectType • Wide carriage

429.

All-In-One Mobile Microcomputer Center



The answer to your storage problem. This space saver is designed to organize your entire microcomputer system- including your printer- in less than three square feet of floor space. Crafted from wood solids and matching veneers, this is a high quality solution for your computer furniture needs.



FREE MULTI-MODE FONT WITH PURCHASE OF LQ-510

Q-510

eaturing SmartPark™ paper handling • 180
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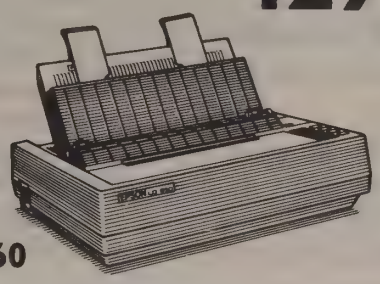
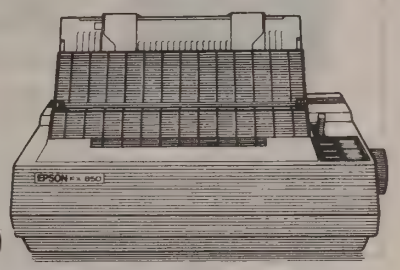
285.



LQ-860

Epson's newest letter quality color printer • 300 CPS draft • 98 CPS NLQ.



FX-850

• 9 pin dot matrix • 264 draft 54 NLQ • Push tractor paper park for single sheet feed.

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IN STOCK

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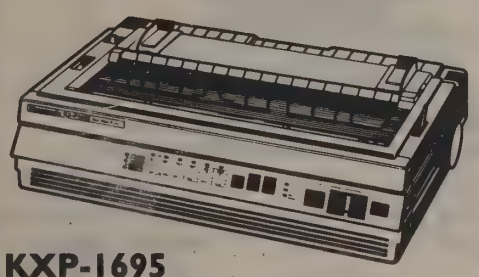
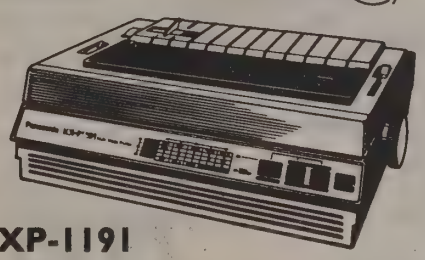


KXP-1695

• 9 pin • EZ set control panel • 330 CPS draft • 66 CPS NLQ • 8 resident fonts • 16.5" wide carriage • Push/pull tractor • rear, bottom and front paper feed.

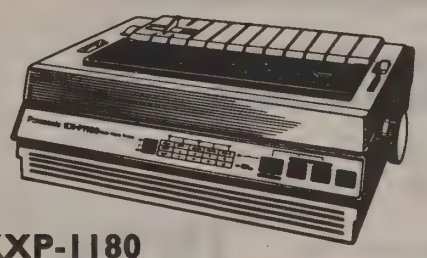
395.



KXP-1191

• 9 pin • EZ set control panel • 240 CPS draft • 48 CPS NLQ • 6 resident fonts • Push/pull tractor.

259.



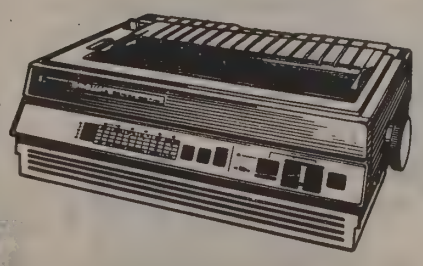
KXP-1180

• 9 pin • EZ set control panel • 192 CPS draft • 38 NLQ • 6 resident fonts • Push/pull tractor • 11.7" carriage.

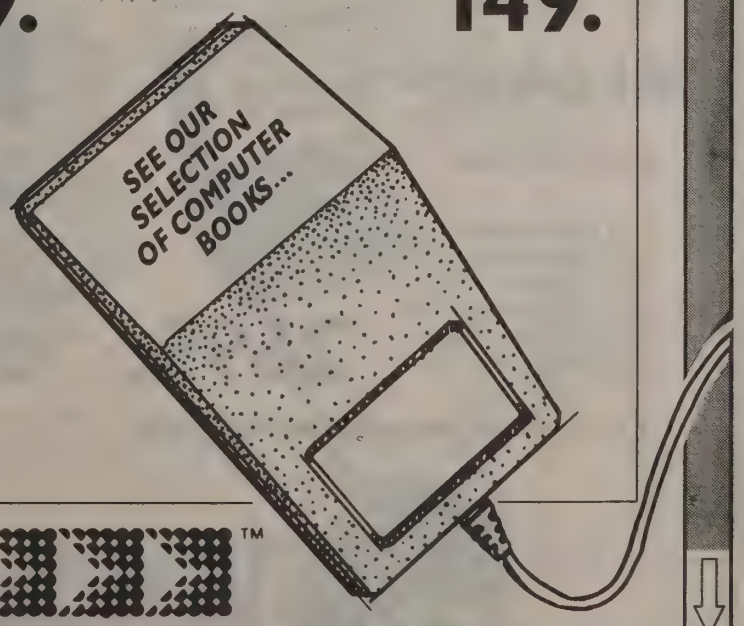
149.

KXP-1124

• 24 pin • EZ set control panel • 192 CPS draft • 63 CPS NLQ • 7 resident fonts • 11.7" wide carriage • Push/pull tractor • 360 x 360 dpi graphics.



AVAILABLE



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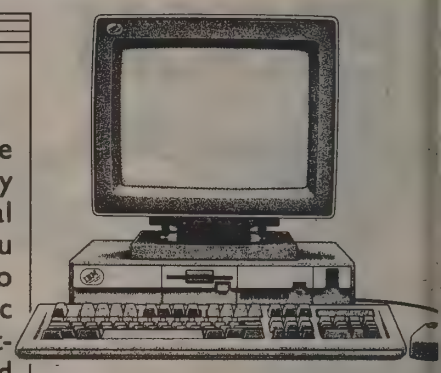

The Best for Less. IBM PS/2® 30-286

• 10 Mhz 80286 processor •1 MB RAM expandable to 16MB RAM • 1.44MB floppy drive • VGA graphics on board.

Monitor extra **1295.**

PS/2 30-286 30 MB **1649.**

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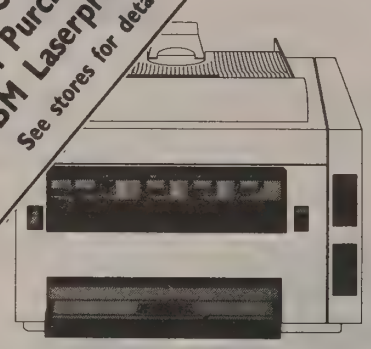
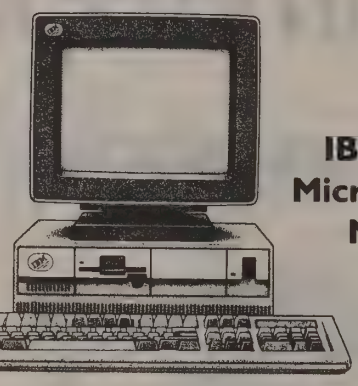


IBM Laser Printer 4019001 10PPM

• 10 pages per minute
• HP comp. **1595.**

4019 IBM All Stores **Laser Printer E 1029.**



IBM PS/2 70 Micro Channel™ Model 60

• 80386 - 60 MB hard drive • 1.44 MB floppy
• Built-in VGA • 2 MB RAM.
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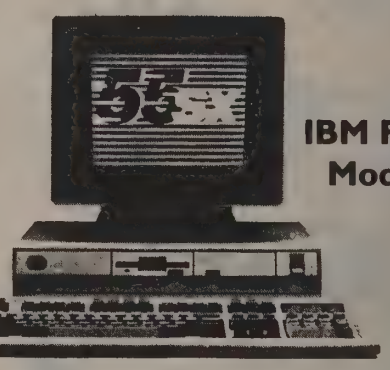

IBM PS/2 55 Model 30

• 80386SX 16 Mhz processor • VGA on board
• 2MB RAM expandable to 16MB • 30MB hard drive.

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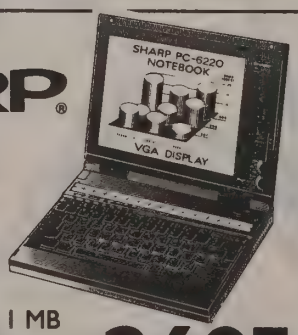

Only 4.4 lbs!

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NOW WITH 2MB RAM

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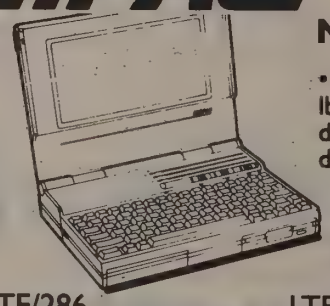

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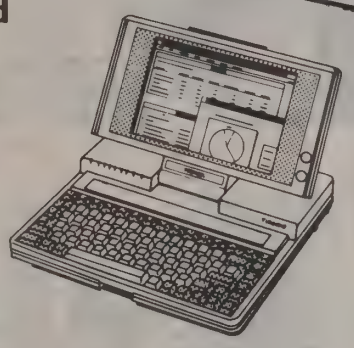
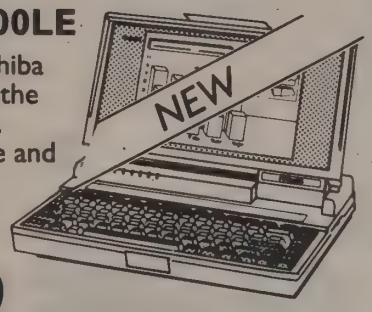


Toshiba 1000LE

The newest Toshiba Notebook with the hottest features. 20MB hard drive and a 1.44MB floppy drive.



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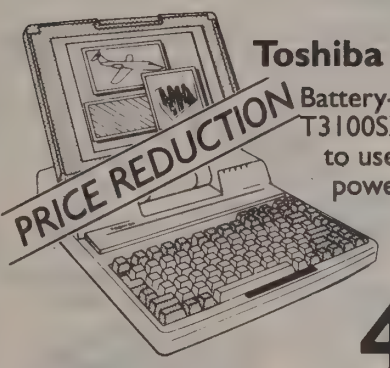

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Battery-operated T3100SX Freedom to use 386SX power anywhere.

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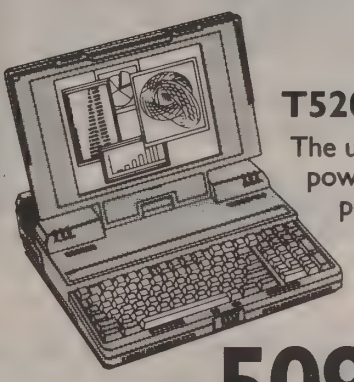
The ultimate in power and portability.



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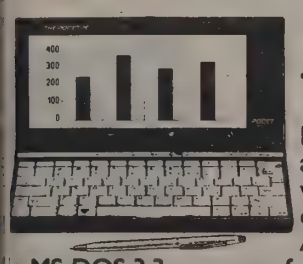

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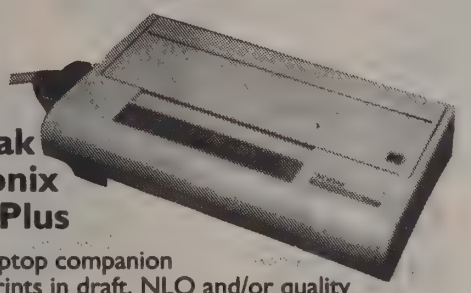

Kodak Diconix 150 Plus

The laptop companion that prints in draft, NLQ and/or quality mode, designed with potability in mind.

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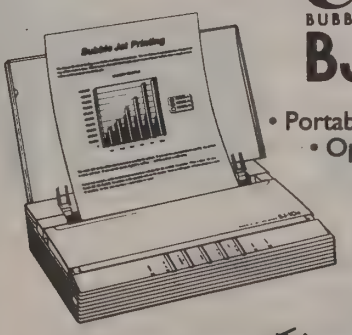

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• Portable 300 dpi printer • Optional sheet feed.

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• Lifetime warranty • Available for all Toshiba portables • This month's specials.

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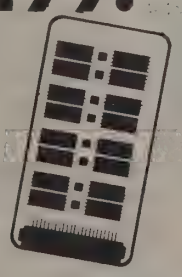
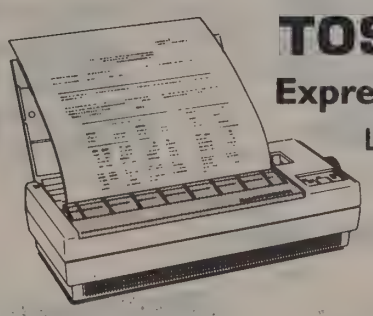


2MB T1000SE/XE 369.



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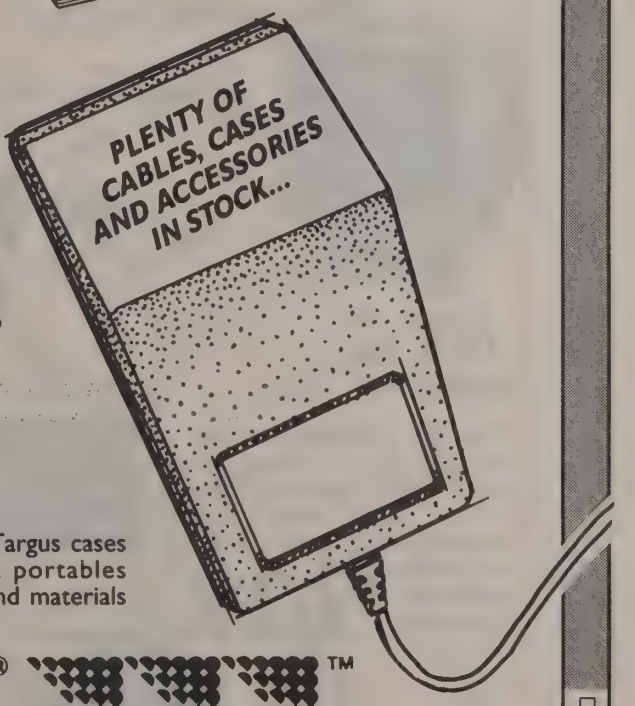

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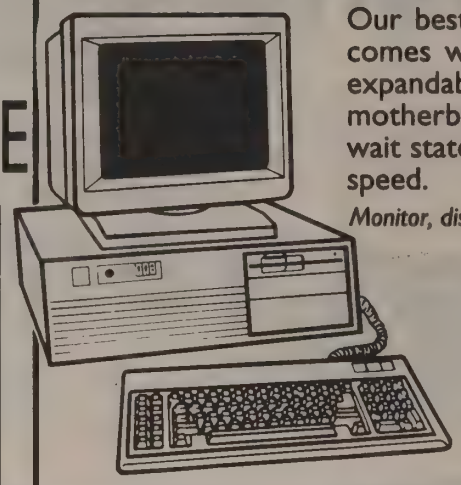

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Our best selling Turbo 286 comes w/512K of memory expandable to 4MB on the motherboard. 16 Mhz at 0 wait states means maximum speed.

Monitor, display card extra

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- 16Mhz 386SX
- IMB RAM
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- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

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WEA S486-2 Standard

- 4MB RAM upgradable to 8MB on motherboard; 16MB w/32 bit memory card
- I/O, 1.2MB FD, 10 keyboard • IDE controller
- Desktop case
- AMI BIOS
- 64 K RAM cache, upgradable to 256K
- 1-32/8 bit slot
- 6-16 bit slot
- 1-8 bit slot
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- 1:1 HDC • 1.2 FD • 101 keyboard
- IMB RAM

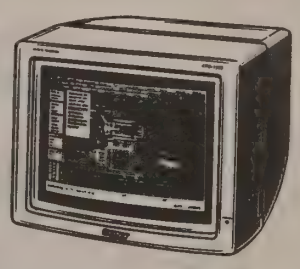
386/33 Mhz

- IMB RAM • 1.2MB floppy drive
- 1:1 hard drive controller
- 64k cache • 101 keyboard

1095

SONY

Sony 1320 VGA



- VGA color monitor
- Analog input
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- 14" VGA color
- .31 dot pitch
- Includes tilt & swivel base

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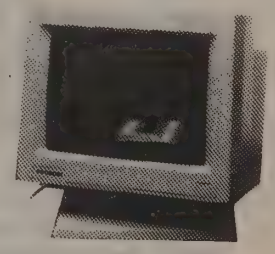
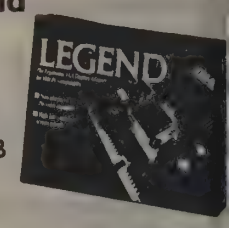


SIGMA DESIGNS

Sigma VGA Legend



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- Exceeds European ergonomic standards for flicker-free displays • Upgrade kits in stock (VGA CARD ONLY)

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Leading Technology

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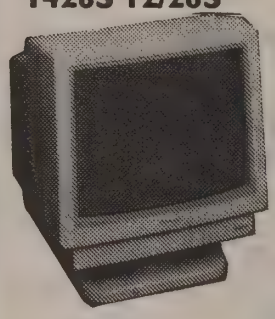
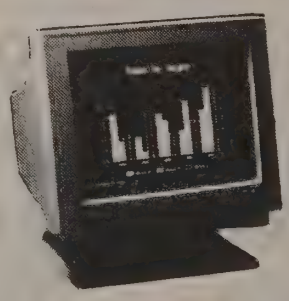


14" analog multi-frequency 1024 x 768, 28mm dp

399.



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- 14" amber flat screen 720h x 350v with tilt and swivel.

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MultiSync 3D

The NEC 3D is one of the best multiscan monitors made. 1024 x 768 resolution means you can use sophisticated Super VGA software and hardware with this screen.

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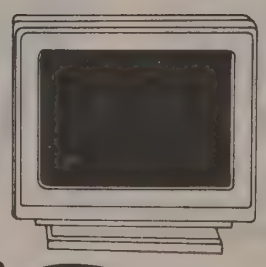

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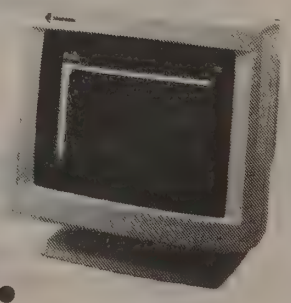
MZ4571 14" Monitor

- Flat screen • Black and white only • 122 col., 640h x 720v with tilt and swivel.

119.



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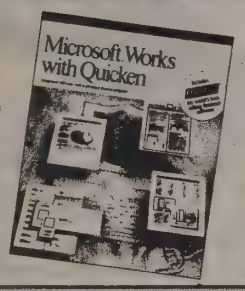
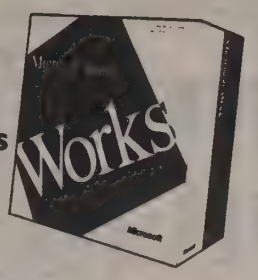


Microsoft Works for IBM and Compatibles



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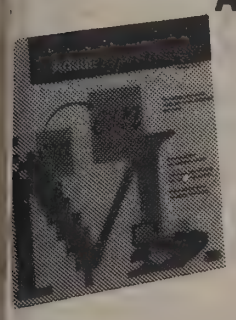

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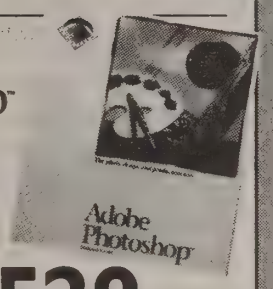

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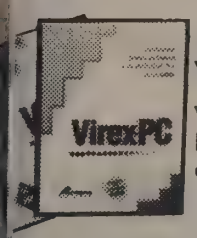

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irex (Mac).....69.
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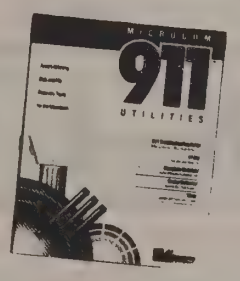
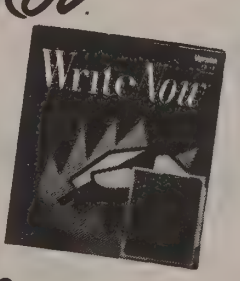


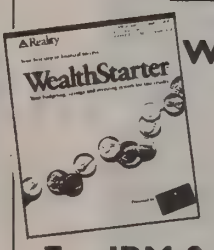
129.

T/Maker



169.

Reality TECHNOLOGIES



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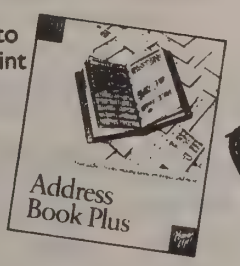

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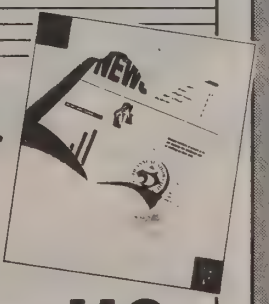
Express Publisher



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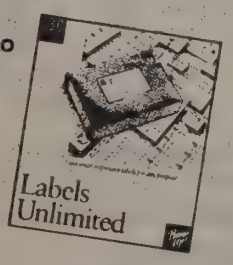

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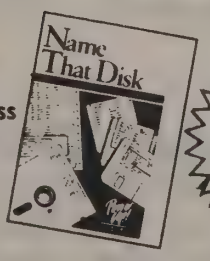

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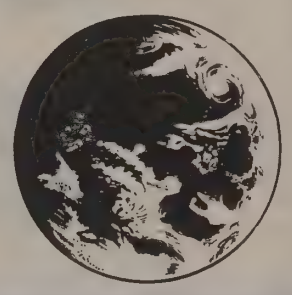

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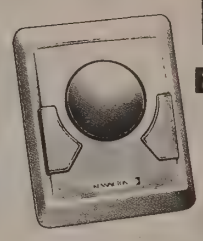

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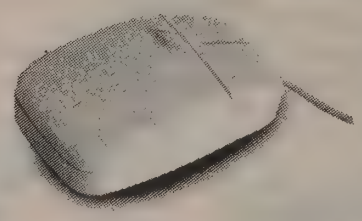

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MainLan GTi

Low-Cost Networking With Novell Upgrade Path

BY WAYNE A. YACCO

Recently I asked U.S. Sage to let me evaluate its proprietary GTi network. When the starter kit arrived, though, it contained not the proprietary LAN card, but the company's Ethernet NIC (network interface card).

Well, I could understand why it might want me to look at its latest and greatest. But, just the same, it wasn't what I'd asked for and I wasn't going to look at the stuff.

After reading some literature, I changed my mind. Not only are these cards nearly as cheap as the much slower proprietary cards, but they are Novell certified. That means you can run NetBIOS-compatible GTi software on it today, and Novell NetWare tomorrow—using IPX. It's a valuable upgrade path.

MAINLAN

MainLan isn't overly sophisticated, but it provides the basics with very little fuss. You can use GTi to share disk and printer resources, control access with passwords, transfer files, and manage local and remote printing.

For example, you have some choices when a transfer operation threatens to overwrite a file of the same name—however, using an alternative file name is not one of them. You can overwrite or skip the transfer. There are privilege levels, but they are invested in resources, not users. This approach is less flexible than some alternatives, but creates a network that's simple to administer.

MainLan GTi is a peer-to-peer network—any workstation can have equal access to the resources of any other. However, capabilities such as email and resource sharing can be limited through configuration. Three different installations—ranging from 32K for a workstation with only file transfer and printing capabilities, to 58K for a file-and-print server, to 115K for a full-featured server—are available.

The GTi network doesn't use standard DOS commands for file management. Instead it has a pop-up menu system with commands of its own. The directory command, for instance, displays hidden files, lists all file attributes, and automatically pauses at the end of each screen of data. The F1 key lists workstation names for the entire network when one must be selected for a file operation.

MainLan installation is also simple, but it is unforgiving. There is no opportunity to confirm or reenter choices. Fortunately for those of us with less nimble fingers, the entire process takes only a few minutes. GTi cards and software both worked without modification with test systems representing both ends of the spectrum: a Kris 486 and an old Compaq Portable 1.

The documentation offered nothing for the one error message I encountered, "Unable to install station name." You won't run into that one if you follow instructions carefully. Still, I like software that assumes I'm as careless as I really am.

MainLan includes a pair of first-class diagnostic routines—Responder and Diagtest—that make hardware testing easy. The two modules work together. I ran Responder on the Compaq, and it displayed the port address, free I/O areas in reserved high memory, the NIC type and memory configuration, and the NIC ID. It also tested the on-board RAM and availability of interrupts 2 and 3. Then it settled back to wait for a packet. When I ran Diagtest on the Kris, it performed the same tests and sent a stream of packets across the network looking for Responder. When it found Responder on the Compaq, Diagtest verified both cards were working properly. Responder acknowledged receipt of the packets with a message of its own.

Sage provided only two NICs, and it wasn't possible to test operations with other traffic on the network. However, file transfers are very fast under the optimal conditions that a two-station network provides.

A GTi starter kit with two 8-bit ethernet cards is $499. Additional 8-bit cards are $199. The GTi starter kit with two 4Mbps proprietary network cards is $399. Additional proprietary cards are $179. (They also run NetWare.)

GTi offers a lot for a small investment, and it protects that investment against obsolescence very effectively. Furthermore, Sage has just concluded a licensing arrangement with Multisoft for Super PC-Kwik, and the company claims significant performance gains are achieved when it is used with GTi.

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If your client workstations have experienced memory-management problems lately, rush out and get a copy of Memory Commander from

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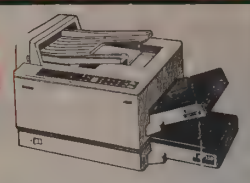
Panasonic Office Automation OA — KX-P4450i



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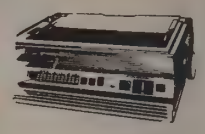

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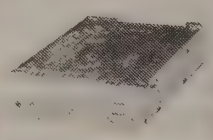

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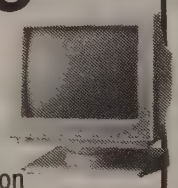

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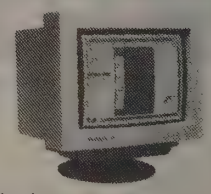

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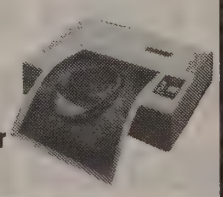

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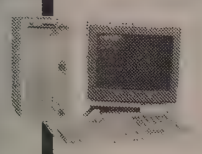

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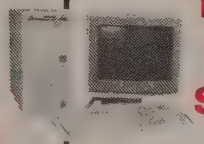

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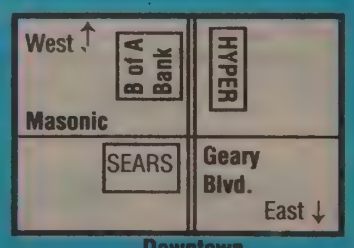

V Communications. Well, get going. It's a phenomenal approach to managing EMS and XMS memory. In addition to memory drivers, the program also includes its own integrated RAMdisk and console drivers. V Communications claims that Commander is compatible with Novell and VCPI.

Configuration is practically automatic.

Not only are these cards nearly as cheap as the much slower proprietary cards, but they are Novell certified. You can run NetBIOS-compatible GTi software on it today, and Novell NetWare tomorrow—using IPX. It's a valuable upgrade path.

Gone are the calculations of starting addresses. You don't even tell it how much memory you have. The Shadow—make that Commander—knows. The only hitch is that you've got to tell it where your NIC (LAN card) is in I/O memory. (You can get that from your documentation and jumper settings.) Otherwise, just load it into a system with a clean boot. It handles everything, including a copy of the Config.sys file that it makes with required changes—all of which are explained step-by-step on the screen incidentally.

Dynamic memory tuning, reconfiguration and a host of other features are accessed from a control panel. These include a memory map, a memory-status display, and utilities used to determine in which video modes a program can, and will, be run. Five memory modes allow you to optimize the memory available for DOS applications by dynamically reconfiguring the location and size of the video buffer. Roughly 900K can be obtained depending on your system software, installable drivers, and TSRs. For example: On a 25MHz 486 from Kris Systems, with drivers installed for a hard disk and EMS memory (as well as a shadowed video and system BIOS), the largest available memory was 776K.

Application programs automatically use these memory modes according to their profile in a database. If it's not already in the provided database, a profile can be determined with a program-test function. Autodesk's awesome 3D Studio passed for memory mode C, and Memory Commander allowed 656K for DOS and the application.

The program also provides a great deal of control over drivers and TSRs. This includes whether they can be loaded, how they can be loaded (e.g., as duplicates), where they can reside, and whether locations are fixed or determined automatically.

There are some limitations. DOS tables and buffers can't be loaded into EMS memory under DOS 4.0 while using Memory Commander. This means that VDISK, FASTOPEN and the BUFFERS= commands must not employ their /X parameter. Extra base memory is obtained, in part, at the expense of the system's video buffer and the reduced flexibility can impact some software. ■

RESOURCES:

MainLan GTi
U.S. Sage, Inc.
2005 Tree Fork Lane
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Memory Commander: $99.95
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Computer Conferences: Life During Wartime

CNN may have grabbed the world's attention, but you don't have to have cable to get the latest war news around the clock

BY ADAM GAFFIN

When Iraqi missiles first fell on Tel Aviv, Yale Benedek was in a sealed room wearing a gas mask—and letting friends around the world know what was happening via his computer keyboard.

Benedek, who lives in Rehovot, fifteen miles south of Tel Aviv, had made sure his terminal was in the sealed room so he could stay in touch with other users of the Internet Relay Chat, which allows live discussions between scores of users around the world using the Internet research network.

"Sirens are [going] off all throughout Israel here," he typed on January 19, the second night of the attacks. "I have mask on and I am inside my sealed room. God, I can't sleep really, now."

Then, less than a minute later: "Israel is being attacked, I hear booms."

Over the next several days, people logged into this system knew before TV viewers when the air raid sirens had gone off in Israel, whether missiles had actually landed, and when the all-clear had been sounded. It's just one example of how computer networks have come alive during the Gulf war as an alternate medium—one that has, so far, not suffered from jammed circuits or government censorship. Computer networks compete with radio and television in providing the latest information around the clock and have become a way to reassure anxious families of people on the front line.

GULF DISCUSSIONS ONLINE

And they have become a place for people to discuss every facet of the war.

CompuServe users now post six hundred messages a day in a special Gulf forum, spokeswoman Debra Young says, adding that during the first two weeks of the war, close to eight thousand CompuServe users logged into the forum.

The Whole Earth Lectronic Link set up a similar forum, which continues to get heavy use, director Cliff Figallo reports. The WELL conference now has more than two hundred topics on everything from the origins of the Gulf crisis to media coverage to a debate on the use of tactical nuclear weapons. Even before the Iraqi oil spill, users were discussing the potential environmental fallout of the war. Messages come in so frequently that users accustomed to reading several days' messages at once are now finding it necessary to ask for just the last few hours' postings.

Every day, hundreds of messages flow into Usenet "newsgroups" set aside for discussions of Mideast politics, Jewish and Arab culture, and Desert Storm itself.

Young says CompuServe has seen a 50% increase in use of its various news databases, including an extra-fee service that provides AP, UPI and *Washington Post* stories fifteen minutes after they are released. Clarinet Communications of Waterloo, Ont., has been providing a similar, free service with UPI war news on Usenet. Delphi provides UPI stories as soon as they are filed. Prodigy has a team of editors providing their own stories in a special, ad-free section that takes advantage of that network's graphics capabilities by providing maps and graphs to illustrate stories.

FIRST-PERSON REPORTS AND MESSAGES HOME

But beyond the wire stories, networks and bulletin-board systems

So far, governments have yet to interfere with the networks. But there is heavy self-censorship involved. After papers quoted an online report from a DEC worker in Saudi Arabia that included a comment about how many oil tanks at Dhahran were still filled—making them potentially more explosive Iraqi targets—Digital now refuses to discuss its network with reporters.

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Adam Gaffin writes about personal computers for the Middlesex News *in Framingham, MA.*

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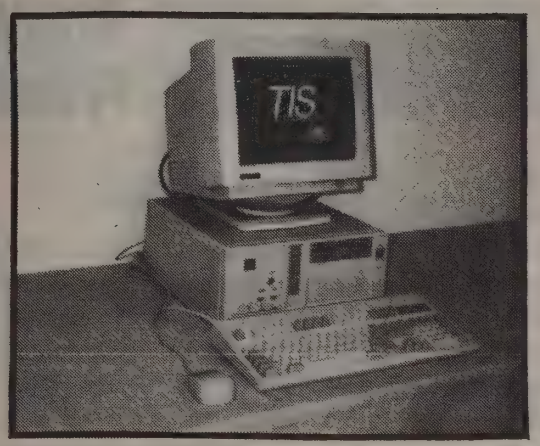

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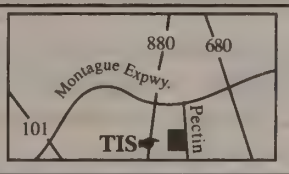

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have let people on the front lines tell their own stories.

Eyal Ben-Tamar, a computer consultant who also lives in Rehovot, has been sending accounts of life under the threats of Scuds to the *Middlesex News* in Framingham, MA via CompuServe.

"Last night, I spent the night with gas mask waiting for the Iraqi missiles to land," he wrote after the air-raid sirens went off for the first time. "It is a terrible feeling because you are helpless. I was a soldier in the Lebanon war and I was there under heavy artillery attacks, but it is not the same. It is the first time for Israelis sitting in their home[s] to worry about those things."

In Saudi Arabia, Americans, Britons and Saudis trade war stories and helpful hints on more than thirty BBSes, many set up by workers of the Saudi Aramco oil company.

"I should mention that it's not a wise idea to be going out seconds after the all-clear sounds, to go 'scudding' for souvenirs," one user of the Jebel Rebel BBS in Dhahran wrote on January 24. "There just might be a chance of some formidable long-lived contamination lurking in the debris."

Some users of these networks have begun playing the same role as amateur radio operators, getting through messages to worried relatives around the world.

David Lisbona, a Tel Aviv resident whose parents live in Great Britain, quickly organized a network of CompuServe users in Israel and other countries to do this. The Israeli volunteers take phone calls from Israelis and then, via CompuServe, send messages to an appropriate overseas volunteer, who calls the worried family on his end. Lisbona said he now has one hundred volunteers around the world—including Fernando Gelbard, the Argentine ambassador to France.

The Israeli government does not let foreign reporters announce the specific locations of missile strikes, says Lisbona, who normally uses email to stay in touch with his telecommunications-products company in Great Britain. Consequently, he says, "After every missile attack, the phone lines to and from Israel get jammed solid in both directions." Contributors to a forum on Jewish culture on Usenet have started a similar telephone-relay system.

BYPASSING THE CENSOR

"I think the new media (such as IRC) are creating an interesting demonstration of what people have been calling the global electronic village," says Barry Shein, president of Software Tool and Die, a UNIX consulting firm in Brookline, MA. Shein, who now frequently logs into the chat system used by Benedek, noted that Chinese students effectively used computer networks to get the word out and organize protests after the Tiananmen Square massacre. He said many Soviet universities now have access to worldwide networks and that he is now talking to somebody at a university in Tunisia about hooking that country into Internet.

"What we are moving towards is the possibility of a spreading 'Electronic Witness' network," he says. "For example, one gets conflicting reports—and often a bit unbelievable—about the situation in Baghdad right now. If there were folks there with network access, and that network access could be kept alive (not very hard with a little cleverness—these days there are unrestricted satellites which will relay network transmissions even if the phone system is dead), we would have reports flowing in, unfiltered, about the situation there."

So far, governments have yet to interfere with the networks. But there is heavy self-censorship involved.

Digital Equipment Corp. eagerly helped newspapers in Dallas, TX and Worcester, MA do stories on how its workers in the Mideast were using an internal network to reassure friends and family in the US that they were OK. But both papers quoted a report from a worker in Saudi Arabia that included a comment about how many oil tanks at Dhahran were still filled—making them potentially more explosive Iraqi targets—and the company now refuses to discuss its network with reporters.

Israeli volunteers take phone calls from Israelis and then, via CompuServe, send messages to an appropriate overseas volunteer, who calls the worried family on his end. There are one hundred volunteers around the world—including Fernando Gelbard, the Argentine ambassador to France.

The Turkish organizers of a conference on the war on the Bitnet network cancelled the conference for fear of upsetting the Powers That Be in Turkey, a country divided over support for the alliance effort.

Robert Werman, who's been uploading copyrighted first-person stories from Israel, says some overseas friends have wondered whether his reports do not contain information that could be helpful to the Iraqis. He said he tries very hard to ensure this does not happen—he has not, for example, identified the neighborhoods hit by Iraqi missiles.

Lisbona said there has been no Israeli censorship of phone, facsimile or computer messages, adding, "If, however, the transmitter oversteps the mark and an imprudent journalist and editor in the USA runs with it and publishes, the Israeli authorities will try and find out where the leak was and rap some knuckles.

"There is no way to control all channels in a democratic country, and the minute we understood the reasons [for censorship], we Israelis practice self-censorship."

"It will be hard to establish 1984-ish information cartels with this sort of populist telecommunications," Barry Shein says. "In fact, that's the next trend to watch for: government control by various nations in an attempt to stop up this reality leak. I suspect some will use hackneyed issues such as 'crackers,' pornography and computer criminals as an excuse to 'protect the public' from free access to networks. It seems paranoid, but consider what has happened to the radio spectrum under the guise of 'public good' and the gusto with which 'pirate radio' is prosecuted. Telecommunications do not offer such easy excuses like limited bandwidth, but I fear that there are some who will not be able to keep their hands off it. It's very powerful, and those who feed off of ignorance and isolation will see it as very dangerous." ■

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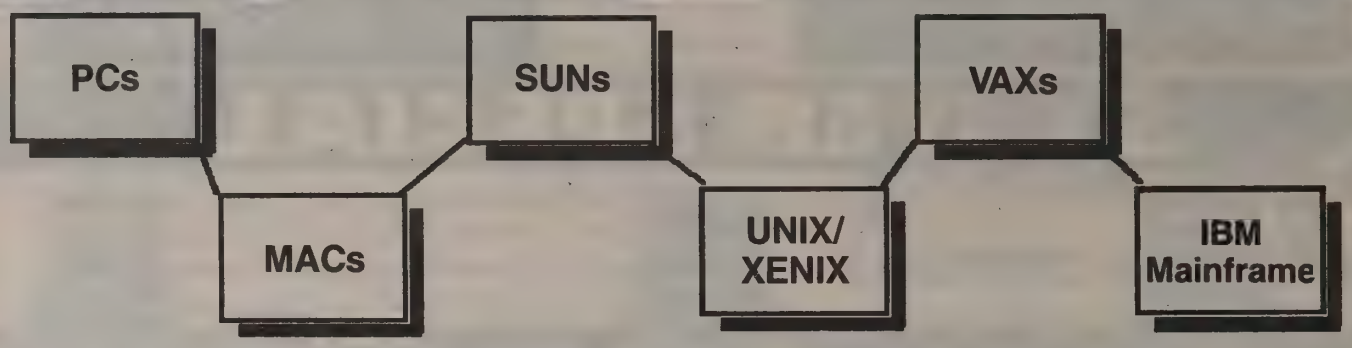

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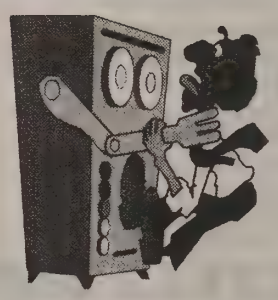

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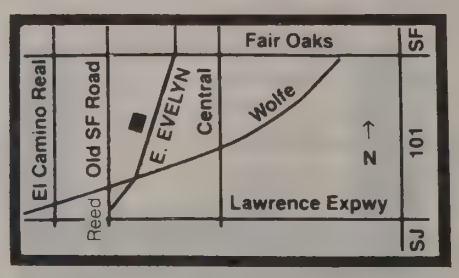

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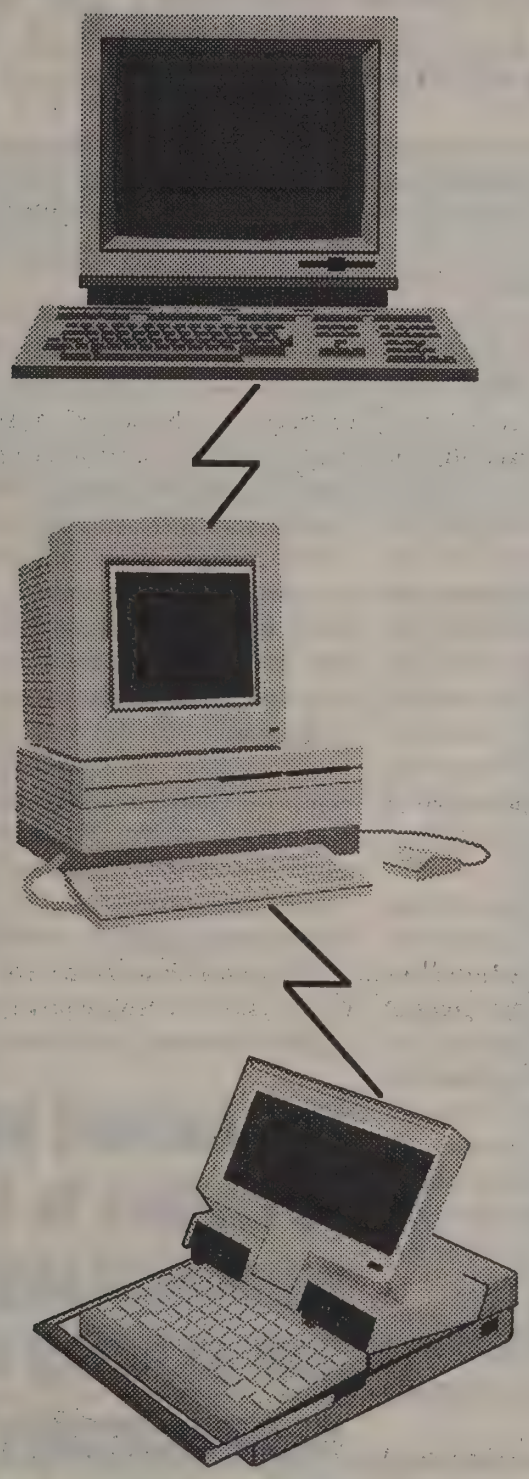

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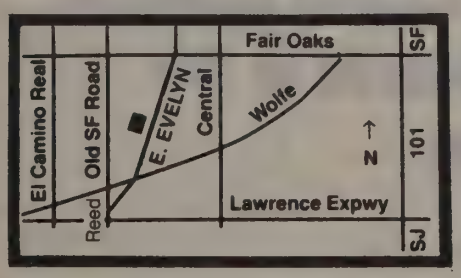

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Bulletin Boards And The Virus Plague

According To Boardwatch *Editor Jack Rickard, Your Local BBS Is Likelier To Give You A Cure Than A Virus*

BY JACK RICKARD

Computer viruses are big business. The only thing that's grown faster than fear of viruses is the number of scams involving the cures. Anti-viral techniques comprise the patent medicine show of the nineties. The press has seized on the virus as a sure seller and repeatedly done stories on coming virus plagues due by a certain date. That the "outbreak" doesn't ever seem to quite materialize does little to dampen the spirit.

Bulletin board systems take most of the blame from self-appointed experts on this subject. However, there is little to support the theory of BBS systems as a source other than the simple logic of the uninitiated. It would make perfect sense, at first glance, that BBS and shareware software were the prime carriers of viral software. It hasn't historically been the case. In fact, no major spread of viruses can be traced to electronic bulletin board systems at all.

At least two commercial software releases have included virus infections, and most outbreaks appear to have occurred in university computer labs and corporate pools of PCs where, frankly, software piracy is the most exciting diversion available. Since piracy is illegal, if your company system or university lab does suffer an outbreak, it's best to play it safe and blame it on shareware downloaded from a BBS. It wouldn't play well to publicly suspect it was the twelve thousand illegal copies of Windows making the rounds that led to the spread. As a result, electronic bulletin boards are the culprit of convenience—all real-world experiences to the contrary.

As an individual user, your chances of encountering computer viruses are a little better than winning the lottery, but not by much. And dialing BBS systems and downloading shareware by the truckload wouldn't seem to up the odds noticeably. Everyone I've spoken with who monitors bulletin boards professionally and downloads software as a way of life seems unanimous in the view that you can't buy a virus online. Perhaps it's because BBS operators were dealing with Trojan Horse programs years before viruses became trendy.

Or perhaps it's because being called the Typhoid Mary of the computing universe caused most system operators to be particularly aware of the problem. In any case, bulletin boards have been unfairly painted as a source of virus programs.

An electronic bulletin board is basically a large hard disk drive connected to the telephone network. A BBS operator who does contract a virus has a much bigger problem than the average computer user, and it comes to light very quickly. A virus-stricken board is quite literally out of business. The current paranoia has caused BBS operators to scan all uploads automatically for viruses—with very few actually turning up. It is demonstrably true that there are more virus infections in the Fortune 500 than in all the 23,000 publicly operated boards in the country put together. This puts the theory of the BBS as the most common source of viruses under serious question. In most cases, BBSes are more likely to be the quickest and least expensive place to locate a cure if you do have a data problem caused by viral infection.

All that notwithstanding, it's little comfort if *your* system suddenly sports a Jerusalem B star in the middle of the screen or if YOUR COMPUTER IS STONED starts cropping up in the middle of your masterpiece novel—no matter what the source. For the unlucky few, viruses are an unpleasant and frightening experience. And they can cause the loss of data. The sense of intrusion on your data by this invisible force that only shows itself after the damage is done can be a bit emotional. The sense of violation is considerable.

In one way, the arrival of the virus has been fortunate. As the prices of hard disk drives have fallen, quality assurance has suffered. And any dying disk drive, fading power supply, or static zapped keyboard can be safely blamed on the feared virus. But even better, the arrival of the virus has caused people to back up their data. A case could be made that more people have had a recent backup on hand at the time of their hard disk crash (everyone has one; it's when—not whether) because of fear of viruses.

YOU THINK YOU'VE GOT A VIRUS. NOW WHAT?

Still, if you do suspect a virus, what do you do?

The first order of business is to back up

The current paranoia has caused BBS operators to scan all uploads automatically for viruses—with very few actually turning up. It is demonstrably true that there are more virus infections in the Fortune 500 than in all the 23,000 publicly operated bulletin boards in the country put together.

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your data to fresh media. There is really no danger in this if you know what data is. It is *not* your copy of Windows. "Data" refers to the word processing text files, spreadsheets, database files, etc. that programs operate on.

Viruses are computer programs, nothing more or less. They are not alive. You have to actually run them to get them to do anything. And you can't run files ending in .TXT, .DOC, .DBF, etc. They must carry a .SYS, .EXE, .COM, or .BAT suffix to be viable. (The information in this article applies specifically to IBM compatible computers. The nature of virus infections and cure procedures on Macintosh, Amiga, and other computer types varies widely from those described here.) All those files, coincidentally, are still on your originally purchased diskettes anyway so they *are* backed up safely. The damage you fear resides in the loss of the data files you have created with those programs. You can quite safely back up these data files if your system is working at all.

It would make perfect sense, at first glance, that BBS and shareware software were the prime carriers of viral software. It hasn't historically been the case. In fact, no major spread of viruses can be traced to electronic bulletin board systems at all.

After you've safely backed up your data to a separate location, with *no* executable files included, eradicating the virus is relatively simple. Just erase every drive on your system and reformat it using the low level format procedure. The virus, of whatever strain, is gone.

You do face the unpleasant task of rebuilding your system by installing all your programs from the original diskettes before reloading your data. That can be a daunting bit of work, but in most cases, you don't need to do it. There are software utilities available to fix your machine "in place" without reformatting and restoring your entire system.

HOMEBASE BBS AND THE COMPUTER VIRUS INDUSTRY ASSOCIATION

John McAfee has had little economic incentive to quell the hysteria. McAfee Associates derives its income from curing viruses. But he does do the best anti-viral utilities around, he releases them to individuals as shareware at a modest cost, and he runs a superb BBS focused on computer viruses.

The Homebase BBS operates on six lines in Santa Clara California using TBBS software. Five 2400 bps lines are available at (408)988-4004 and a single US Robotics high-speed line is available at (408)988-5138. McAfee does seem to know more about viruses than anyone we've encountered; his utilities are updated almost monthly to cover new viruses, and his system provides some of the best information available on detecting, and recovering from, computer viruses.

Several utility programs are freely available for download by first-time callers. His Virus Scan Version 6.3V72 utility is available in the file SCANV72.ZIP. The file contains the SCAN.EXE program, some reasonably good documentation, and a validation program to make sure you have received his scan program and *not* a virus posing as one. The problem with most anti-viral utilities is that they themselves become the target of viruses which claim to be the utility. McAfee's use of the ZIP validation program is a good idea, but anyone capable of writing a virus we must assume is also capable of defeating a validity check program. It would likely be best to download these utilities directly from McAfee's BBS.

SCAN.EXE scans your hard disk drives file by file to detect any of 162 basic known virus programs and some 251 variations on the theme. It will tell you if you have a virus and will return a code indicating what particular virus you're suffering from. A second utility, Clean-Up Version 6.3V72, comes in the file CLEAN72.ZIP. If you do incur a viral infection and run CLEAN.EXE using the code returned by SCAN.EXE, it will actually go in and attempt to locate the infected files, remove the offending virus, and even try to repair the affected files. According to McAfee, 95% of all viral infections are caused by a handful of ten common viruses. STONED and Jersalem B seem to be the most common in North America, so the CLEAN technique generally works quite well.

A third utility is titled NETSCAN. It comes in NETSCN72.ZIP and it's used to detect viruses on local area networks. A series of other utilities will guard your system from viruses, detect viruses while copying any files, etc.

McAfee quite professionally updates his utilities to account for new virus discoveries. For individual home users, Virus Scan can be registered for $25, Clean-Up for $35. In the event they don't handle the problem, McAfee will lend a hand as a consultant.

In addition to the utilities, Homebase BBS offers an impressive array of online information superbly focused on the virus problem. A virus remedy database allows you to key in part of the name of the virus you suspect you have. The database produces some information on that particular program and describes a cleanup solution. The system maintains a special upload area where callers are asked to upload viruses or suspected viruses. You can't download from this area, for obvious reasons, but you can view it; it appears that a large number of individuals have uploaded files for examination.

We also found a fascinating file diagramming hundreds of viruses titled VSUM9010.ZIP.This is actually a text file titled *Virus Information Summary List* prepared, at some obvious effort, by Patricia Hoffman. Ms. Hoffman has documented hundreds of viruses by name, characteristics, original location, and recommended cure.

McAfee has assembled a very useful information service; his utilities are both effective and consistently updated, and despite the obvious profit motive, his presentation is lucid, informative, and for the most part devoid of hysterical vira-hype. If you do encounter a virus or have concerns regarding prevention, this system is probably the most effective and least expensive place to start.

The system is also the home of the Computer Virus Industry Association. CVIA and McAfee Associates appear to be one and the same but the association does make available a 70-page information packet titled *Computer Viruses: Background, Detection, and Recovery* that proves interesting reading. To obtain a copy, send a 9x12 envelope with $2.40 in postage and $4.00 U.S. funds to Computer Virus Industry Association, 4423 Cheney St., Santa Clara, CA 95054; (408)988-3832 voice; fax (408)970-9727.■

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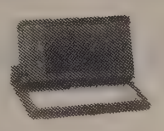

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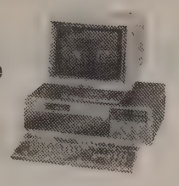

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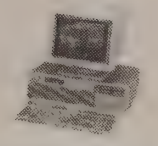

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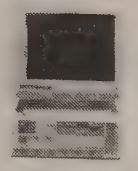

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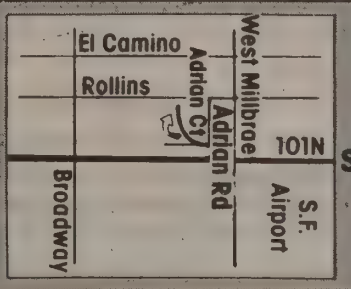

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The Hows And Whys Of Shareware

You've Written Some Software, And You'd Like To Make Some Money. Now What?

BY DAN BAUMBACH

Judging from the responses I received to the article I wrote about shareware publishing last June, there are a lot of people who've written programs and are wondering if shareware distribution is for them. There also seems to be a good deal of misunderstanding about exactly what shareware is.

WHAT IS IT?

The term "shareware" is in the public domain; practically speaking, you can do pretty much anything and call it "shareware." In general, it refers to software that people are free to use and copy, and pass the copies on to others. If you use the program more than once or twice and find you're getting value from it, the author usually asks you to send money in the form of a registration fee, which also entitles you to support. The requests for money can range from "Golly, if you like the program, I'd appreciate some contribution. Whatever you think it's worth..." to "You can use this program at no charge for 30 days, but after that you must register it for $XX." Some of the more confrontive programmers even describe the "karmic" consequences of your using the program without paying for it.

With this variety of marketing styles and an equally wide range of applications, you can see why shareware is often misunderstood. But for many programmers and business people today, shareware is just another form of marketing high quality software, and more and more programmers are making a good living from it.

BENEFITS—LOW COST DISTRIBUTION AND MARKETING

Say you're working on a program. You think it's really going to be terrific and you'd like to make some money off of it.

If it's a program written for a specific business or industry, advertising in the trade journals of that industry or direct mail marketing may not be prohibitively expensive. If your software is more generic, you'll probably find the prices of national advertising in computer magazines out of your reach.

One alternative is to try to sell your program, or its distribution rights, to a large software company. Many authors do this, and it's possible to do quite well, though you'll only be getting a small percentage of gross sales, and you'll get no direct feedback from users.

Direct contact with users and avoiding the high costs of conventional marketing are the most important reason authors choose shareware. Some also feel quite strongly about the try-before-you-buy aspect of shareware, but in my experience an equal number choose it for the low overhead costs.

Copyright © 1991 by Dan Baumbach. All rights reserved. *Dan Baumbach is president of Helpware, a shareware and computer consulting business in San Rafael. He can be reached at (415)453-9779 or on CompuServe 71320.1277.*

USER FEEDBACK

After my article came out, a number of authors contacted me, wanting me to look at their program and advise them about shareware distribution. It was flattering to be considered such an expert that I could assess not only the merits but the profitability of a product, but if I had those skills I'd probably never have time to write articles.

These people were overlooking one of the greatest benefits of shareware distribution: direct user feedback.

How do you know if there's a market for your program? How do you know if it's what users want? How do you know what features to add and what not to waste your time on? How do you get beta testers?

Shareware offers a great solution to all those problems. For example, the online system CompuServe provides a whole range of features for its subscribers, from stock quotes to online games, and it's also probably the best distributor of shareware programs in the world. I still get most of the registrations for my program Hard Disk Director from CompuServe, often from users as far away as Germany.

CompuServe offers numerous forums about different types of computers and software. Looking for beta testers? Place a message in some likely forums. Want some user feedback? Upload your program to an appropriate library, and post a message that it's there and you're looking for comments. Then just pray you have enough time to read and absorb all the responses.

Many shareware users are not shy. Many will give you off-the-wall suggestions. Nonetheless, many users offer valuable advice you would never have thought of.

For example, Hard Disk Director started out as two programs offering a more elegant and souped-up version of *PC Magazine*'s programs DR, RN, and CO. That was two years ago. Now in Version 4.5, Director still resembles those programs in speed and ease of use, but now it's as powerful as any hard disk manager available, complete with a full hard disk menu and file viewers for many file formats. At least half the changes in the product were the brilliant ideas of others.

So for the cost of a modem, and a CompuServe subscription (about $40), and some connect time, you can do all the market research and get all the beta testers you want.

WHAT ABOUT THOSE UNREGISTERED USERS?

Authors contemplating shareware marketing are often worried about the many people who use their program and never pay for it. That used to bother me a lot, and sometimes, during slow periods, it still does.

Many authors cripple their programs so that users will have to pay to get a working version. Nothing disturbs me more than a piece of software that treats me like a criminal, and the consensus among other users seems to be the same. Respect your users and they will respect you.

Of course many people will use your program and not pay for it. On the other hand, traditional software companies also have problems with illegal copying of their software. I personally believe that commercial companies have to write off a larger percentage of their profits because of advertising costs and illegal copying than shareware authors lose to unregistered copies.

All software sells mostly by reputation and word of mouth. Whether

Continued on page 120

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PANASONIC KX-P1180 9 PIN	$225
PANASONIC KX-P1124 24 PIN	299
PANASONIC KX-P1624 24 PIN	375
PANASONIC 1624	379
EPSON LX-810 9 PIN	210
STAR PRINTER NX-1000 II	185

CASES W/POWER SUPPLY

FULL SIZE CASE 3-OPENING	$55
AT FULL SIZE w/230 P/S	105
MINI TOWER CASE w/200W P/S	99
BABY CASE w/200W P/S WITH 6 SLOTS FOR FLOPPY	95
MID TOWER CASE w/200 P/S WITH 6 SLOTS FOR FLOPPY	165
FULL TOWER CASE w/220 P/S 5 SLOTS FOR FLOPPY & w/LED & CLOCK	179

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LOWEST PRICES

IBM PS2 Model	MEMORY Added	IBM Part #	AMT Price
PS/2 30-286, 50 & 60	512K KIT	30F5348	$54.00
	2MB KIT	30F5360	175.00
PS/2 50Z & 55-SX	IBM SIMM (Above 55-sx only)	6450603	95.00
	2MB SIMM (Above Installed on System Board)	6450604	179.00
	2-8MB	1497259	599.00
PS/2 70-E61 & 70-121	1MB SIMM	6450603	85.00
	2MB SIMM	6450604	160.00
PS/2 70-A21	2MB SIMM (Above Installed on System Board)	6450608	170.00
	1MB SIMM	6450603	85.00
	2MB SIMM (Above Installed on Expansion Board #6450605)	6450604	160.00
PS/2 80-041	1MB MODULE	6450375	145.00
PS/2 8-011 & 80-311	2MB MODULE (Above Installed on System Board)	6450379	269.00
	1MB SIMM	6450603	85.00
	2MB SIMM (Above Installed on Expansion Board #6450605)	6450604	160.00
55SX, 65SX	4MB	34F2933	485.00

COMPAQ Model	MEMORY Added	COMPAQ Part #	AMT Price
DESKPRO 386/33, 486-33	2MB MODULE	115144-001	$225.00
DESKPRO 386/20.25	1MB MODULE	113131-001	139.00
	4MB MODULE	113132-001	369.00
DESKPRO 386/20e, 386/20e 125	1MB BOARD	113644-001	285.00
	4MB BOARD	113645-001	635.00
	1MB MODULE	113131-001	185.00
	4MB MODULE	113132-001	499.00
DESKPRO 386s	1MB BOARD	113633-001	265.00
	4MB BOARD	113634-001	635.00
	1MB MODULE	113646-001	139.00
	4MB MODULE	112534-001	369.00
PORTABLE III	512K KIT	107331-001	55.00
	2MB KIT	107332-001	175.00
DESKPRO 386/16	4MB BOARD	108070-001	795.00
	8MB BOARD	108072-001	1325.00
PORTABLE 386	1MB KIT	107651-001	285.00
	4MB BOARD	107653-001	1050.00
SLT/286	1MB MODULE	110235-001	325.00

APPLE Model	MEMORY Added	APPLE Part #	AMT Price
MAC II IIx IIcx & SE/30	1MB KIT	MO218	$60.00
	4MB KIT	MO2707	250.00
	16MB KIT		1600.00
MAC IIci	4MB MIT	MO292LL-A	275.00
	16MB KIT		1600.00
MAC SE & PLUS	1MB KIT	MO218	60.00
	2MB KIT	MO219	120.00
	4MB KIT	MO2707	250.00

HP LASER Model	MEMORY Added	HP Part #	AMT Price
VECTRA QS/16S	1MB	D1540A	$112.00
	4MB	D1542A	349.00
VECTRA QS/20PC, RS/25PC & 20C	1MB	D1640A	$126.00
	4MB	D1642A	365.00
VECTRA 486PC	1MB	D2150A	$115.00
	4MB	D2151A	390.00

AST Model	MEMORY Added	AST Part #	AMT Price
BRAVO/286	512K KIT	500510-010	$59.00
	2MB KIT	500510-002	172.00
	4MB KIT	500510-008	340.00
PREMIUM 286 ADVANCED	512K KIT	500510-001	70.00
	1MB KIT	500510-007	130.00
	2MB KIT	500510-002	190.00
	4MB KIT	500510-008	360.00
FASTBOARD 386	1MB KIT	500510-007	95.00
	4MB KIT	500510-008	369.00
PREMIUM WKST/286	512K KIT	500510-010	70.00
	2MB KIT	500510-002	185.00
PREMIUM WKST 386SX	512K KIT	500510-010	70.00
	1MB KIT	500510-007	135.00
	2MB KIT	500510-002	172.00
	4MB KIT	500510-008	369.00
PREMIUM 386/16/20c	1MB KIT	500510-007	95.00
	4MB KIT	500510-008	369.00
PREMIUM 386	1MB KIT	500510-003	150.00
	4MB KIT	500510-004	369.00
PREMIUM 386c	2MB KIT	500510-002	172.00
	4MB KIT	500510-008	369.00
PREMIUM 386/25ex	1MB SIMM	500718-001	85.00
PREMIUM 386/33	1MB SIMM	500718-002	80.00

ZENITH Model	MEMORY Added	AMT Price
386/25	1MB KIT	$139.00
	2MB KIT	299.00
386/33	1MB KIT	139.00
	2MB KIT	299.00
	4MB KIT	499.00

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68020 16MHz	$129.00
20MHz	169.00
25MHz	179.00
33MHz	199.00
68030 16MHz	129.00
25MHz	199.00
68010 8MHz	60.00

CPU CHIPS

80386 DX-16	$250.00
80486 DX-25	650.00
80486 DX-33	1150.00
80386 DX-20	275.00
80386 DX-25	325.00
80386 DX-33	355.00
80386SX-16	230.00
V-20-8	6.00
V-20-10	10.00
V 30-10	10.00

DRAM

DRAM 1MGX1

1 MGX1-120NS	$5.00
1 MGX1-100 NS	5.25
1 MGX1-80 NS	5.50
1 MGX1-70 NS	5.75
1 MGX1-60 NS	6.50

DRAM 256X1

256X1-150 NS	$1.79
256X1-120 NS	1.99
256X1-100 NS	2.00
256X1-80 NS	2.25
256X1-70 NS	2.35
256X1-60 NS	2.49

DRAM 256X4

256X4-120 NS	$5.00
256X4-100 NS	5.50
256X4-80 NS	5.75
256X4-70 NS	5.75
256X4-60 NS	6.75

DRAM 64X1

4164-15	$2.00
4164-12	2.50
4164-10	2.75
4164-80	3.00

DRAM 64X4

4464-150	$1.50
4464-120	1.99
4464-100	2.50
4464-80	2.75

256X1-STATIC COL

51258 P-10	$2.99
AAA 2800-08	3.00
AAA 2800-07	3.25
AAA 2800-60	4.50
1X4-80 ZIPP	35.00
1X4-80 ZIPP STT	40.00
4X1-80 DIPP	45.00

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64X4-150 NS 41264-15	$4.00
64X4-120 NS 41264-12	4.50
64X4-100 NS 41264-10	5.00

CACHE MEMORY 16X4

HM 6788-25	$6.50
MC 6288-35	9.50
64X4 CACHE MEMORY	
HM6708P25	24.00

MATH COPROCESSORS

INTEL

8087-5MHz	$80.00
8087-2 8MHz	116.00
8087-1 10MHz	150.00
80287-6 6MHz	130.00
80287-8 8MHz	185.00
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80287-10 10MHz	185.00
80C287-12 12MHz	195.00
80387SX-16	285.00
80387SX-20	295.00
80387DX-16	295.00
80387DX-20	340.00
80387DX-25	425.00
80387DX-33	525.00

AMD

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80C712X-33	135.00

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3167-20 20MHz	$300.00
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3167-33 33MHz	500.00
4167-25MHz	625.00
4167-33MHz	725.00

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83087-16 16MHz DX	$260.00
83087-20 20MHz	270.00
83087-25 25MHz	340.00
83087-33 33MHz	425.00
83SX87-16 16MHz SX	235.00
83SX87-20 20MHz SX	260.00

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8C87-8	$159.00
8C287-10	169.00
8C287-12	189.00
8C287-20	260.00
8C387-25	340.00
8C387-33	425.00

STANDARD SIMMs SALE

256KX8 150NS	$15.00
256KX8 120NS	16.00
256KX8 100NS	17.00
256KX8 80NS	20.00
256KX9 150NS	16.00
256KX9 120NS	19.00
256KX9 100NS	20.00
256KX9 80NS	22.00
256KX9 70NS	25.00
256KX9 60NS	30.00
256KX9 80NS S/C	25.00
256KX9 70NS S/C	25.00
256KX9 60NS S/C	30.00
1MX8 120NS	45.00
1MX8 100NS	48.00
1MX8 80NS	49.00
1MX8 70NS	50.00
1MX9 120NS	48.00
1MX9 100NS	50.00
1MX9 80NS	52.00
1MX9 70NS	55.00
1MX9 60NS	60.00
1MX9 100NS S/C	65.00
1MX9 80NS S/C	90.00
1MX9 70NS S/C	90.00
4MX8 80NS	225.00
4MX9 80NS	240.00
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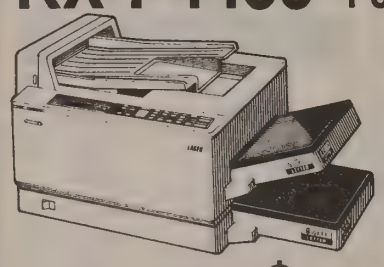
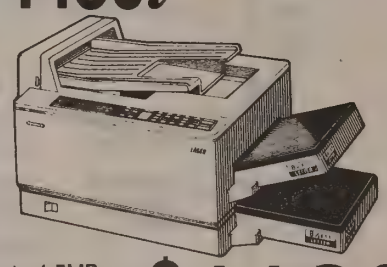


- 2MB RAM exp to 4MB
- 11 pages per minute
- 500 sheet paper capacity
- 26 internal fonts

$1899

Accessories & Supplies for 4455/4450i	
Legal Tray	$49
Envelope Tray	69
Toner	39
Drum Unit	149
Developer	99

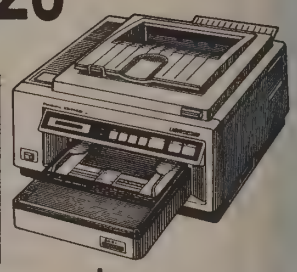
KX-P4450*i*



- 512K RAM exp to 4.5MB
- 6 software emulations
- 500 sheet capacity
- 11 pages per minute

$1129

KX-P4420



Accessories & Supplies for 4420	
Legal Tray	$45
Envelope Tray	69
Toner	39
Drum Unit	119
Developer	89

- 8PPM
- 250 sheet capacity
- 300 dpi resolution
- 512K RAM exp to 4.5MB

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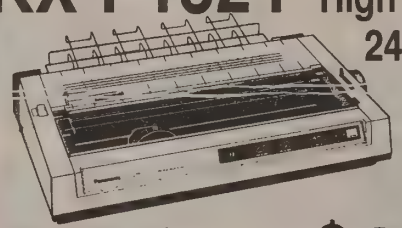
KX-P1524 High Speed 24 pin



- 240cps, 80cps LQ
- Wide 15" carriage
- Memo load for singlesheet paper w/out removing tractor feed

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KX-P1124

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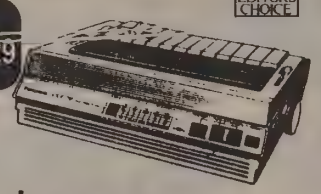
OPTIONAL
Cut Sheet Feeder $129
w/1124 Purchase



- 24 pin print quality
- 192cps; 63cps LQ
- 5 built-in LQ Fonts
- 2 year limited warranty

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KX-P1180

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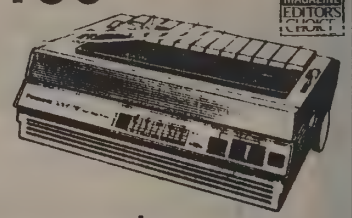

- 192 cps; 38 cps NLQ
- 240x216 dpi resolution
- 80 column

$139

PanaSync C1391

Ergonomical Design!

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- .31mm dot pitch • 1024x768 res
- Works w/ PC/XT/AT, PS/2 or compatibles
- MCA, CGA, EGA, VGA, SVGA & 8514/A compatibles

C1381 14" Analog Multi-Freq. Color Monitor **$399**
- MCGA, VGA, SVGA, 8514/A & MAC color compatibles
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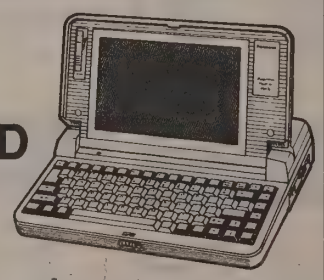
16MHz
w/20MB HDD



- 1MB RAM exp to 5MB
- Backlit supertwist LCD
- 1.44MB, 3.5" FDD
- Rechargeable battery pack
- MS-DOS 4.01, GW-BASIC
- 7 lbs. w/battery pack

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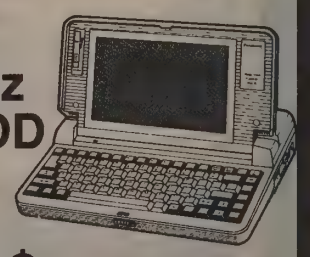
CF-170

V20-10MHz
w/20MB HDD



- 8088 compatible
- Backlit supertwist LCD
- 640K exp to 1.6MB
- 1.44MB 3.5" FDD

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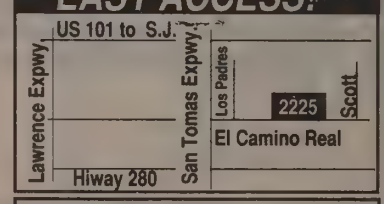

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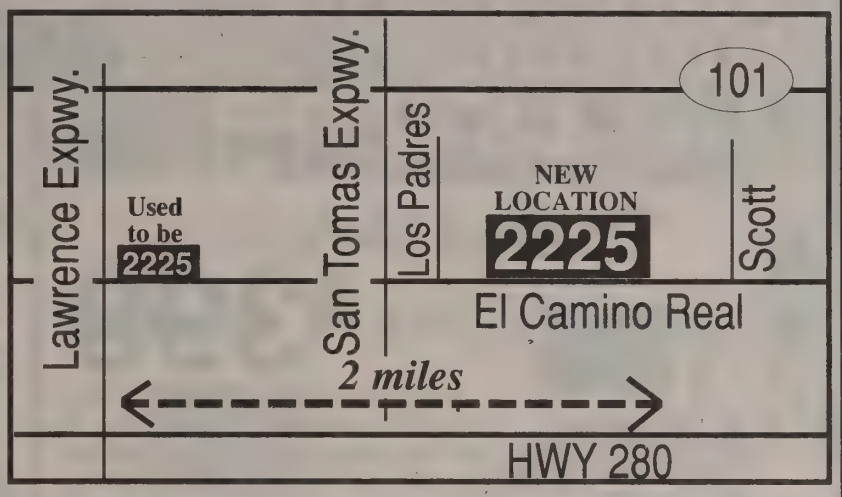

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NORTHGATE COMPUTER SYSTEMS

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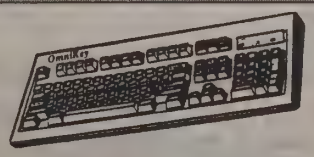

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101n	$69
102	79
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- VGA up to 1024x768
- .25 Superfine dot pitch
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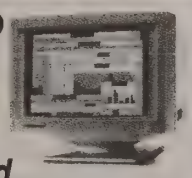
9070S	16" 1024x768	$965
9070U	16" .28mm	1089

Seiko



CM-1450 Multi-Sync NON-Interlaced — $629

- 1024x768 resolution
- .25 dot pitch • Trintron Tube
- VGA, Super VGA, & 8514/A compatibility

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- 14" VGA monitor

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LQ-950	110 columns	459
LQ-1050	136 columns!	629
LQ-2550	400cps, 133cpsLQ	899
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M1909	Wide Carriage	390
M1824L	270cps, 90cps LQ	409
M1924L	Wide Carriage	529

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STB

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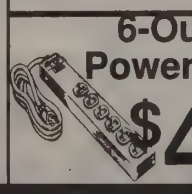

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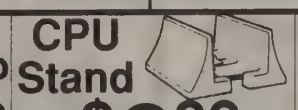

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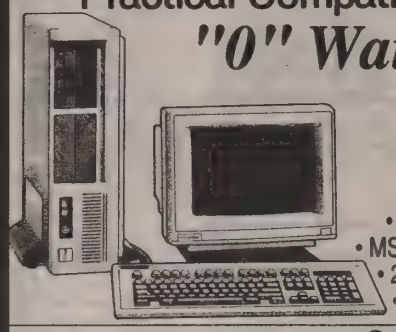

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FULLY COMPATIBLE
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CF125
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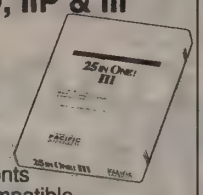

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• Portrait & Landscape
• Fast & easy access to fonts
• HP, Canon & Olivetti compatible

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Upgradeable memory
for HP II, IIP & III

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Complete 386-16MHz,
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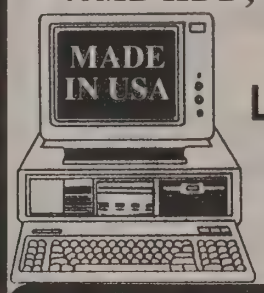

SI: 18.4
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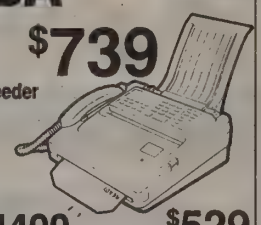

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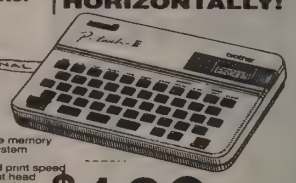

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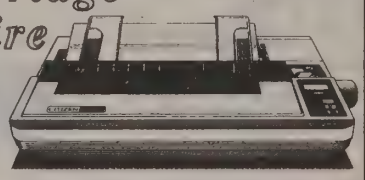

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• 24 wire printer • 192cps, 64cps LQ • 6 resident fonts
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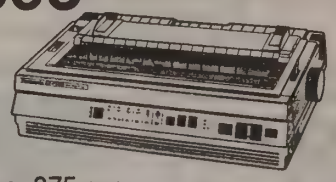
KX-P1695



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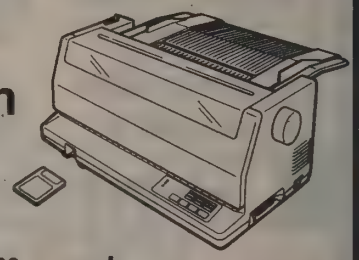

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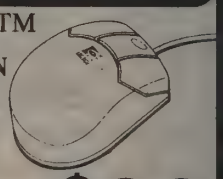

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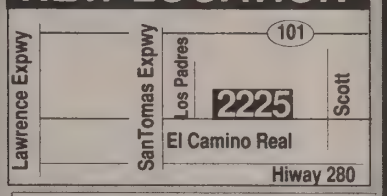

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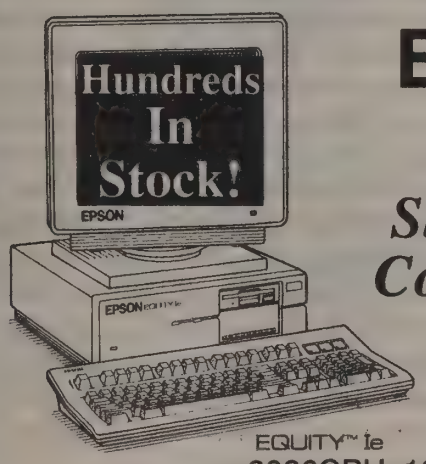

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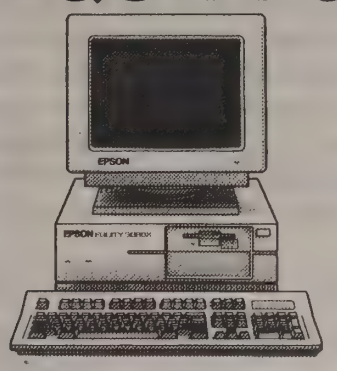

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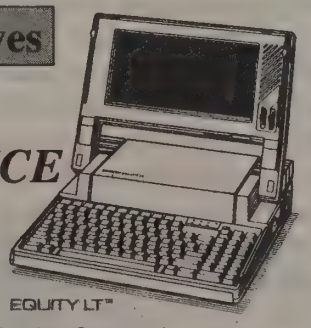

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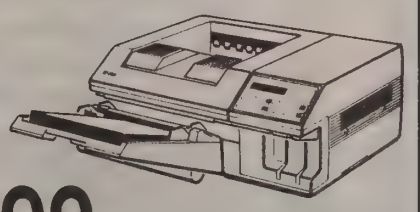

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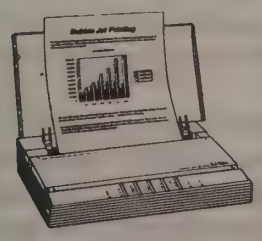

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Continued from page 112

they pay for your program or not, users are your best marketing tools. I recently registered a neat screen saver program that put a fireworks display on my monitor, which I got at a site where I was doing some contract programming. The person I got it from probably didn't pay for it, but I did, and I'll be passing it on to other users, some of whom will also pay for it. Don't worry about unregistered users—consider them part of your marketing costs.

Many authors put a registration reminder screen at the beginning or end of the program, reminding you that you're using an unregistered copy of the program and telling you how to register it. There are many schools of thought about this; after some soul-searching, I finally put one in my program. Because shareware is passed around in various forms, someone often gets a copy with no documentation, and the only way s/he can contact the author is from the information on the screen. So I put one in grudgingly, but I still don't like it.

GETTING THE WORD OUT

When I first released Director, I had very little money and was very new to shareware, so I started very small. I uploaded my program to CompuServe and a few bulletin boards; within two weeks I had my first registration, with a note telling me how wonderful my program was.

As my confidence increased, I started doing more. First I sent Director to disk vendors and user groups, then I put together a press release and sent it to magazines. Recently I put out a brochure and shared a COMDEX booth with other shareware vendors.

But in my opinion, it's word of mouth that makes any product successful. As more and more people become aware of your program, the more it will sell. I give copies of Director to interested people wherever I go. I've demonstrated it at user groups. I've even gotten some of the other contract programmers at work to use it.

You can start with the bulletin board listings at the back of *MicroTimes* as possible places to upload your software; listings for the entire US are available in *Computer Shopper*.

ASSOCIATION OF SHAREWARE PROFESSIONALS

One of the best things you can do as a shareware author is to join the Association of Shareware Professionals (545 Grover Rd., Muskegon, MS 49442), a trade association of shareware authors. Since we're spread out all over the world, most of our communication takes place on CompuServe. Many well-known shareware authors like Jim Button and Marshall Magee are members, as well as not-so-famous authors like myself—and maybe you! All you have to do to join ASP is have a good shareware program, be willing to distribute it without crippling, and commit yourself to providing a certain amount of user support. We have public and private forums, and discuss everything from the best place to get disk mailers and where to print manuals to warnings about unscrupulous dealers. If you have questions, there's always someone willing to share their experience of what works and what doesn't.

WHAT KIND OF SOFTWARE?

After all this, you're probably wondering if there's any real money to be made in shareware. The answer, as always, is that it depends on the product and how it's marketed.

Director, for instance, is a hard disk manager. If I'd thought about marketing it before I wrote it, I might never have started, because that's a fairly crowded area.

The best approach is to find an area that's not so crowded and create something that's better than whatever else is on the market.

It doesn't have to be a large program—shareware utilities sell very well. Paul Mayer came out with Grab Plus, a RAM-resident program that could "grab" addresses from documents, store them in a database, and print them on envelopes. Shareware distribution being what it is, for the first year he only got two or three registrations a month. Then he was written up in *PC Magazine*, in the "First Looks" column and later as an "Editor's Choice." He also joined ASP and learned about marketing, packaging, and such. Paul is moving to a five-bedroom house in Florida to pursue shareware full time.

Since the first people who will be trying out your program are those who frequent bulletin boards, it helps if your program appeals to techies and power users. 4DOS, a powerful replacement for DOS's COMMAND.COM, was an almost instant success because of the hunger of power users for something more.

The growing importance and size of RAM resident programs have produced a lucrative market for shareware author Chip Rabinowitz. Chip markets a number of utilities that allow you to move RAM resident programs out of conventional memory, leaving that memory available for applications. The success of these programs, as well as a library for programmers who want to write RAM resident programs, has enabled Chip to support himself with shareware.

Gary Elfring started putting out shareware programs shortly after the IBM PC was first introduced. He never made much money, though, until he came out with shareware soft fonts. Now Gary makes a good living selling soft fonts and a TSR font downloader as shareware and through direct sales to businesses.

Some of the most popular shareware programs are games. Unfortunately, however, they are also the poorest moneymakers because of the nature of the game audience. Eduardo Martins, an ASP member, is now making a significant part of his income through his solitaire games. He says, "The key point is to find a niche. If your game only appeals to kids, chances are they won't have the money to send you. If your game wears out pretty fast, people won't register either. Thus, you must come up with a game that appeals to adults and can be played over and over again. My solitaire games fit precisely in that category." Eduardo also points out that while most commercial games are designed for the lowest common denominator, the CGA display, many shareware games have broken new ground in designing games for only EGA-or-better and VGA-or-better displays, thereby utilizing the extra colors and sharpness of these monitors.

Other shareware authors support themselves with their word processors, accounting programs, archivers, and text editors. Some of the best utilities for Microsoft Windows come from Wilson WindowWare, a shareware company.

Very few shareware authors made very much money their first year. Though you'll eventually find your program ending up on bulletin boards in Europe and Australia, shareware distribution takes time. Be patient and don't give up too soon; all the successful authors stress patience and persistence. Keep believing in your program, keep supporting it, keep upgrading it.

As Paul Mayer says, "You must not despair when it looks bleak. Keep trying. Push your program into the hands of anyone who will look at it. And most important, create something that you are truly proud of." ■

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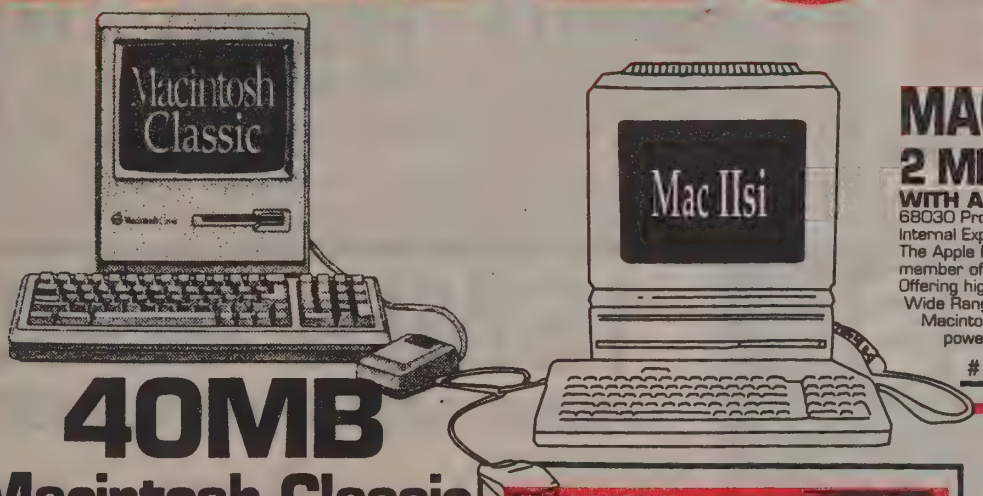

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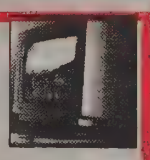

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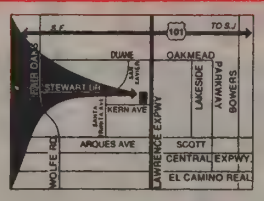

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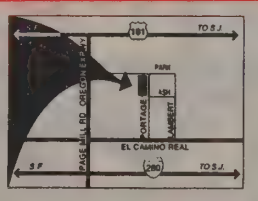

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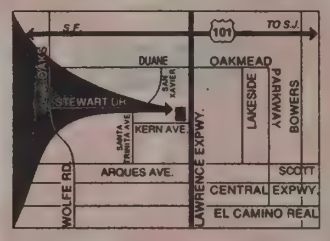

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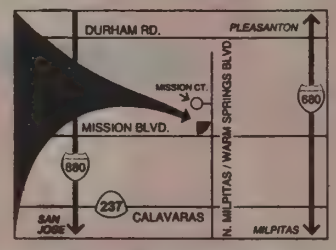

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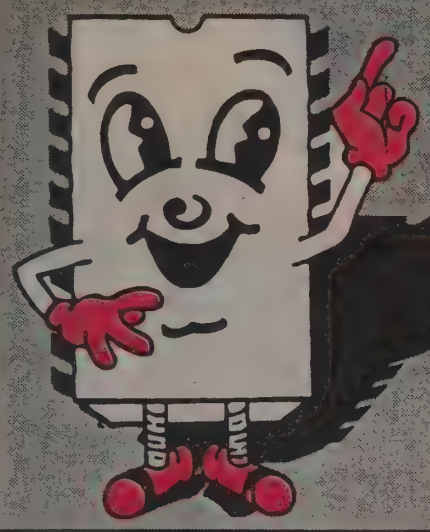

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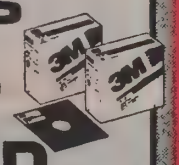

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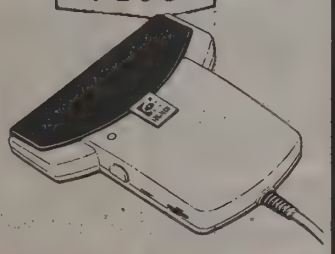

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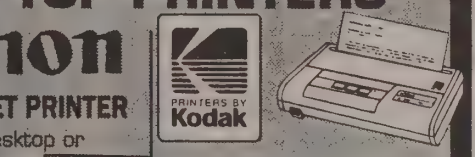

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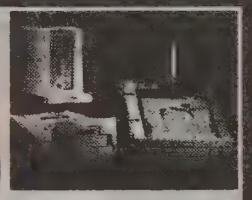

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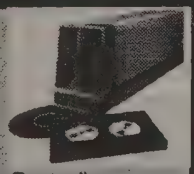

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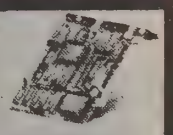

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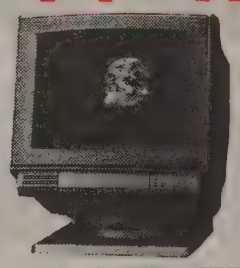

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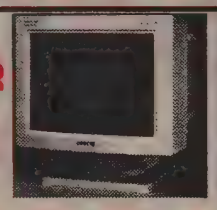

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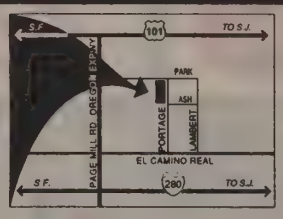

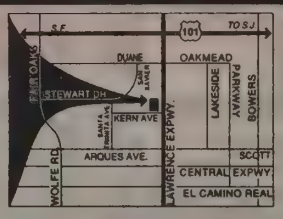

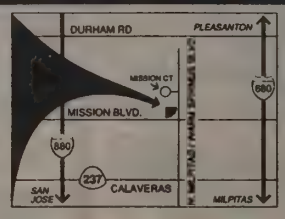

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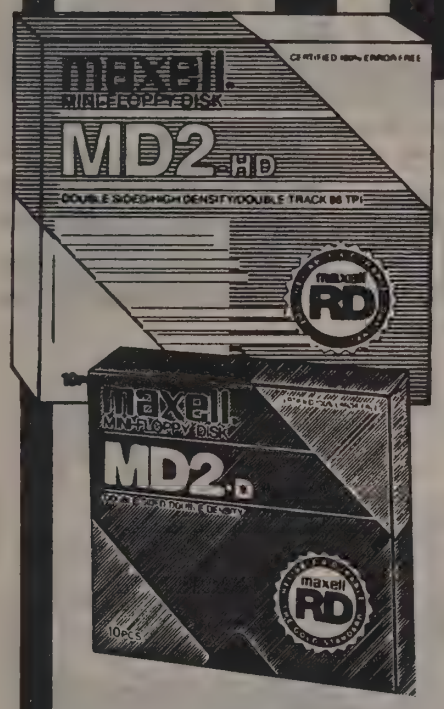

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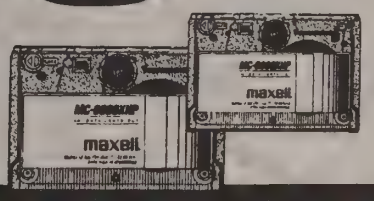

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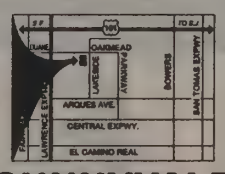

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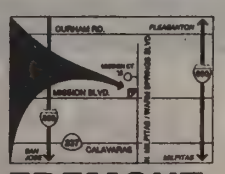

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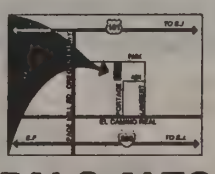

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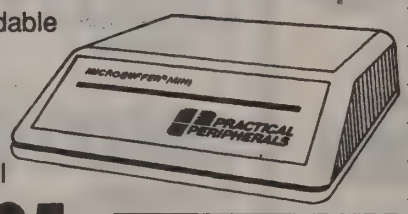

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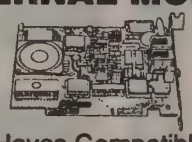

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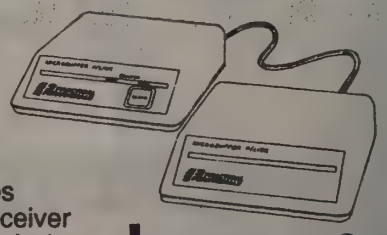

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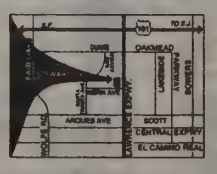

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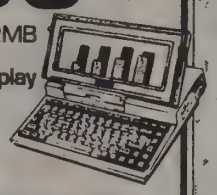

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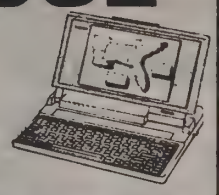

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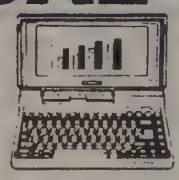

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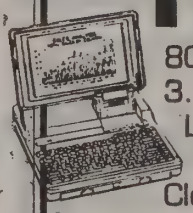

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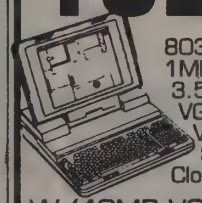

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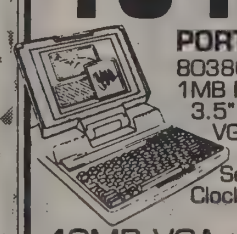

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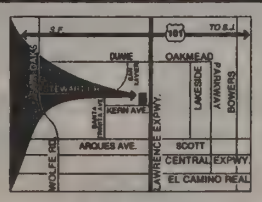

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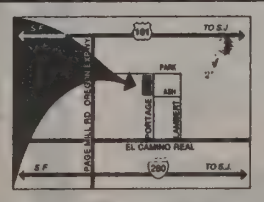

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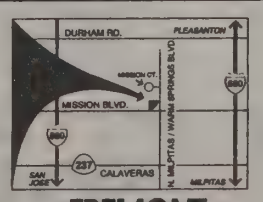

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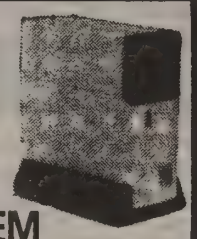

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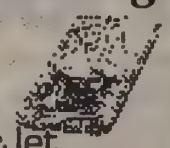

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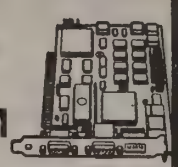

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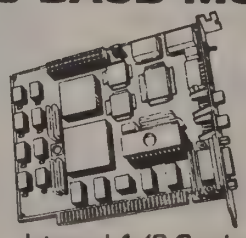

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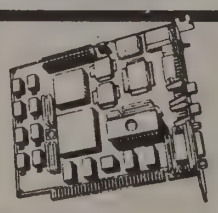

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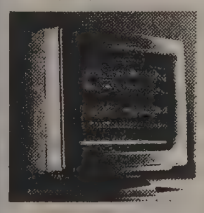

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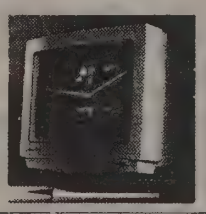

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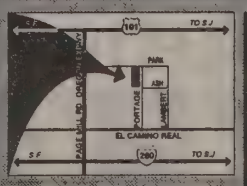

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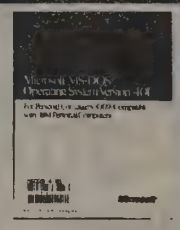

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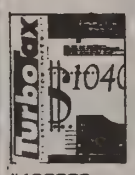

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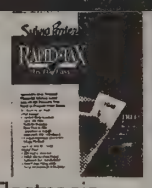

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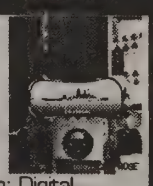

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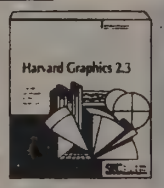

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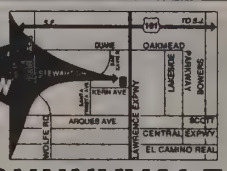

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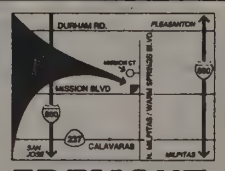

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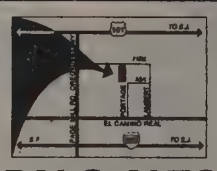

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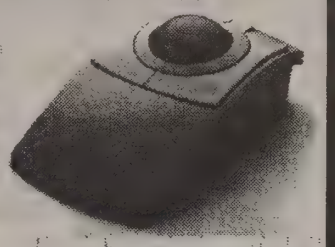

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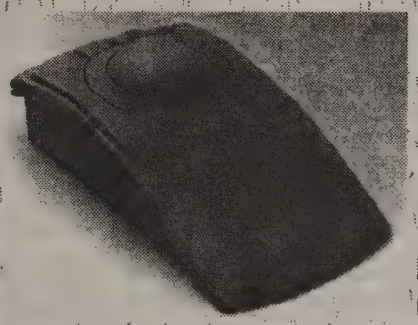

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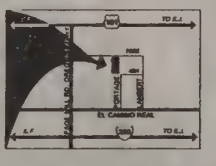

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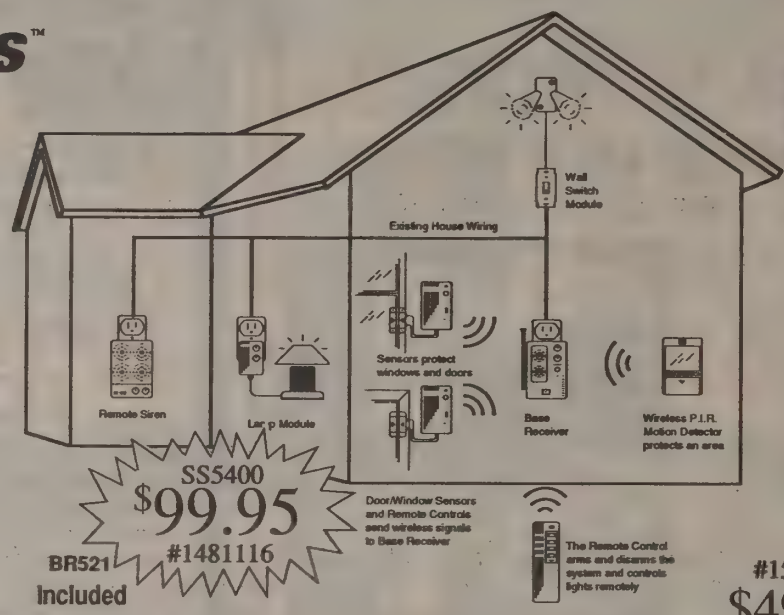
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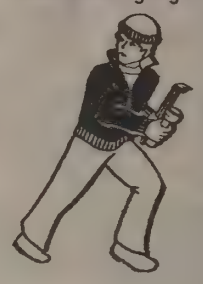
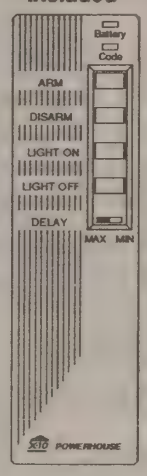
Indoor and outdoor lights (connected to Lamp Modules and Wall Switch Modules) FLASH on and off when the alarm trips.

Few burglars will hang around while all that's going on!

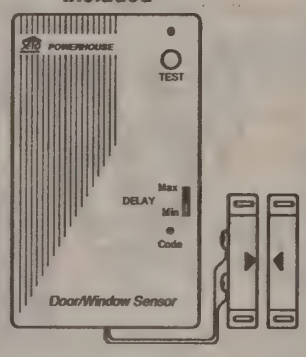


HT544
Included



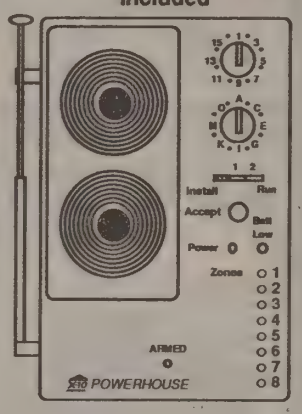
The system is armed and disarmed by the press of a single button — simple! You can also control lights remotely.

DW534
Included



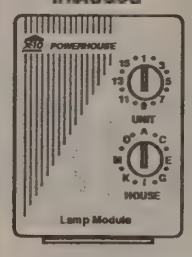
Sensors send wireless signals to the Base Receiver when a door or window is opened. You can protect up to 16 door/windows by adding more sensors. Sensors are supervised for professional reliability - they report in to the Base Receiver every 90 minutes.

BR521
Included



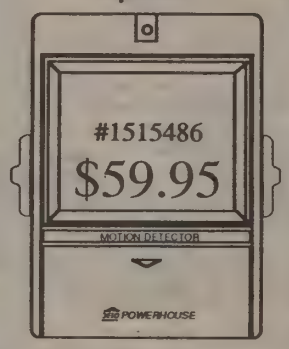
Base Receiver makes a loud noise when alarm is tripped and sends signals over existing house wiring to flash lights connected to X-10 modules.

LM465
Included



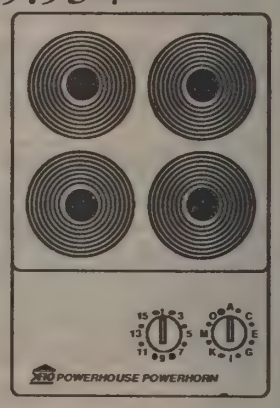
A lamp plugged into the Lamp Module will flash on and off when the alarm trips. You can also turn the lamp on and off by remote control.

SP544
Optional



Supervised Wireless Motion Detectors send signals to trip the Base Receiver's alarm when someone walks within range.

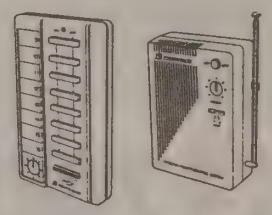
#1515453
$49.95
PH508
Optional



Remote wireless 110 dB siren receives signals over house wiring and trips when Base Receiver's alarm is tripped.

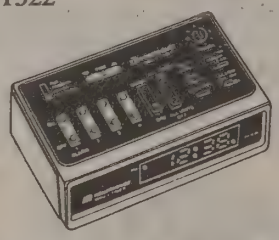
The Protector Plus Supervised Security System can be expanded into a Home Automation System. The items shown below can be used either with the security system or alone to let you turn lights and appliances on and off by remote control. A complete range of controllers is available. The controllers send signals over existing house wiring to control lights and appliances connected to various types of modules. You can time your lights to turn on and off to give your home a lived-in appearance or even turn them on and off from any touch-tone phone. Everything just plugs in. It's just that simple!

Wireless Remote Control
RC5000



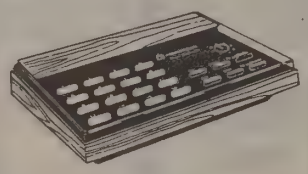
#139994 $39.95

Mini Timer
MT522



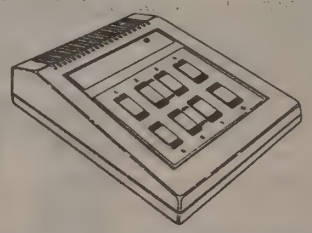
#1425581 $29.95

Maxi Controller
SC503



#118832 $19.95

Computer Interface
CP290

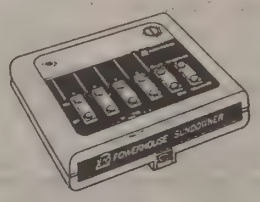


#151860 $49.95

Telephone Responder
TR551

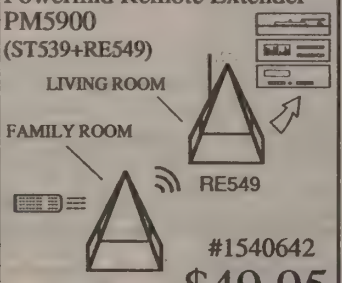
#122064 $74.95

Dusk-to-Dawn Sundowner
SD533



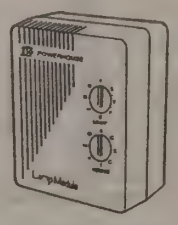
#1481172 $19.95

Powermid Remote Extender
PM5900
(ST539+RE549)



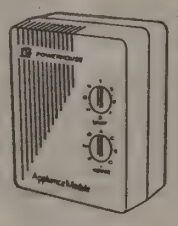
#1540642
$49.95

Lamp Module
LM465



#1481150 $12.95

Appliance Module
AM466



#118600 $14.95

Wall Switch Module
WS467

#118674 $14.95

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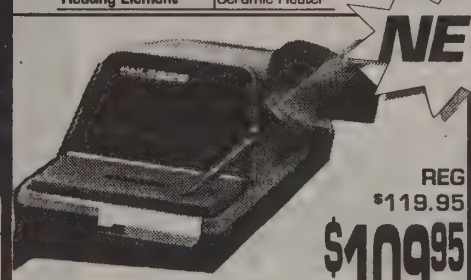
Prices good through March 12, 1991 Limit Rights Reserved

HAKKO 926 SOLDERING STATION

- Super quick heat-up coupled with faster thermal recovery, permits high quality soldering at lower tip temperature
- Built-in ceramic heater sensor maintains temperature with ±0.5°C (±0.9°F) of the setting
- Soldering iron handle is heat-insulated for operator comfort

STATION	HAKKO 926
Power Consumption	Output AC 24V/60W
Temperature	200°C (392°F)~ 480°C (899°F)
Part No. Iron	900M
Insulation Resistance	300MΩ (400°C, 750°F)
Leak Voltage	Under 0.6mV (between Tip and Ground)
Heating Element	Ceramic Heater



NEW

REG $119.95

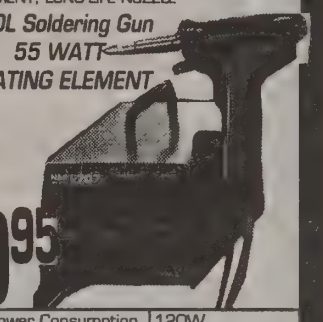
$109.95

#1538898

HAKKO 707 DESOLDERING TOOL

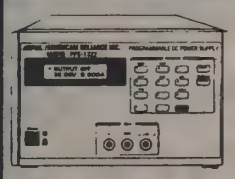
- ACCURATE TEMPERATURE CONTROL
  From 330°C (620°F) to 430°C (800°F)
- INCREASED THERMAL CAPACITY
  Larger, 55W heating element and a double size nozzle thermal capacity over conventional desoldering tools gives greatly increased productivity.
- NO CLOGGING
- CERAMIC HEATING ELEMENT
- PORTABILITY
  Compact vacuum pump unit comes with a handle.It can be easily carried, allowing desoldering wherever there is a power source.
- EASY REPLACEMENT, LONG-LIFE NOZZLE

800L Soldering Gun
55 WATT
HEATING ELEMENT



$399.95

Rating Station	Power Consumption	120W
	Pump Type	Diaphragm
	Vacuum Pressure	600mm Hg(11 lb/in²) Max.
	Motor Power	25W (4-pole)
	Fuse	2A



PROGRAMMABLE DC POWER SUPPLY

- Output voltage & current programming
- Output voltage & current read-back
- Remote Sense
- Programmable over voltage and current setting
- Reverse polarity protection
- Output enable/disable
- GPIB interface
- 3 - Year warranty

$495

SPECIFICATIONS	MODEL	PPS-1322
Outputs		Single
Volts		32V
Current		2A
Watts		64W
Load effect (load regulation)	Voltage	1mV
	Current	1mA
Source effect (Line regulation)	Voltage	1mV
	Current	1mA
PAND friggin Landre multiple (20 Hz 20Mhz)	Voltage	0.5mV3mV
	Current	1mA rms
Temperature Coeficent	Voltage	100 ppm
	Current	200 ppm
Drift (Stability)	Voltage	0.01%+1mV
	Current	0.01%+1mV
Programming Accuracy	Voltage	0.05%+8mV
	Current	0.051%+2mV
Transfer Resonce		64W
Readback Resolution	Operating	0°C-50°C
	Storage	-40°C-75°C
Power		110/220 VAC

VGA RAM

256x4-80	$5.99
256x4 ZIP-80	$5.99
4464-100	$2.29
4464Z-100	$2.59

27C 1 MEG150 NS
1MEG CMOS EPROM
$7.99

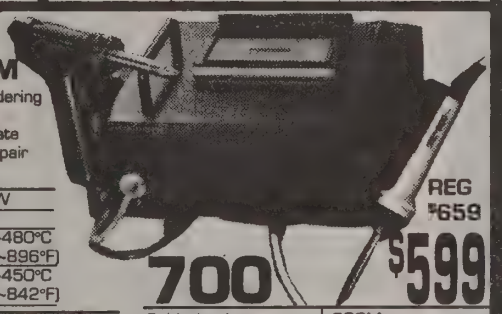
27C512-150 NS
512K CMOS EPROM
$3.99

256K
100 NS $1.49
80 NS $1.59
70 NS $1.49
60 NS $1.99

1 MEG
80 NS $4.99
70 N.S. $5.19

HAKKO REPAIR SYSTEM

Combine the powerful desoldering tool and high performance soldering station with accurate control for more effective repair work.



REG $659

$599

Power Consumption	170W
Output Voltage	24V
Soldering Temp	200~480°C (392~896°F)
Desoldering Temp	350~450°C (662~842°F)
Desoldering Gun	800L
Power Consumption	24V-60W
Filter Pipe	Heat-resistant Pyrex Glass
Cord/Hose	1.5m (4.92 ft.) each
Pump Connection	5-pin metal connector
Nozzle	Standard ø1.0

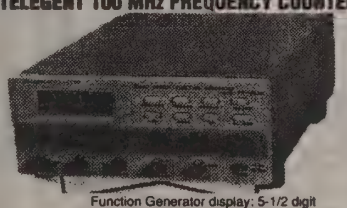
700

Soldering Iron	900M
Power Consumption	24V-50W
Temp Control	Control accuracy of setting at idling temp ±0.5°C (±0.9°F)
Insulation Resistance	Over 300 MΩ at 400°C (750°F)
Leak Voltage	Under 0.6mV

AMERICAN RELIANCE INC.

FUNCTION GENERATOR SERIES WITH BUILT-IN INTELEGENT 100 MHz FREQUENCY COUNTER

- Output Waveforms: Sine., Square, Triangle, Ramp, Synchronouse TTL outputs and DC.
- Frequency Range: 2Hz to 6MHz (FG-506)
- Triggered & Gated outputs
- Adjustable Symmentry/Duty cycle for all waveforms
- Syncronous TTL output frequency: 2Hz to 12 MHz
- Linear & Logarithmic Sweep
- Period Mode (Reciprocal Counting)
- TCXO (optional)



Function Generator display: 5-1/2 digit
Sweep Modes: Linear and Logramatic
External Frequency Counter:
Range: 5Hz to 100MHz
Time base: 10MHz
Temperature: +/- 10 ppm (0°C-50°C)
Resolution: 6 1/2 Digit
Sencitivity: 50m V P-P
Attenuation: X1 and X20
Display: 6 1/2 Digits with frequency ranging units(Hz, KHz, &MHz)

SPECIFICATIONS

Output waveforms: Sine, Square, Trinagle Ramps, Sychronanouse TTl ouputs and DC Funcytions Frequency: 2 Hz to 6MHz
Output Impendance: 50 ohms +/- 2%
Amplitude & DC offset: +/-10V P-P (open circute) or +/- 5V P-P (50Ω)
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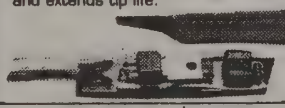
Synchronouse TTL Output: 2Hz to 12 MHz

$695

HAKKO SOLDERING IRONS

This series of irons features faster heat transmission for quicker heating.
Quicker heating means faster start-up and faster thermal recovery during constant soldering operations, for greatly improved work efficiency.
Faster thermal recovery lowers the temperature at the tip, which reduces damage to delicate IC circuit boards, prevents "seizing", reduces the temperature of the handles and extends tip life.



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YOUR CHOICE

Model No.	918M-V12	920M-V12	921M-V12
Power Consumption	85W	95W	85W
Heating Element	Ceramic Heater		
Temperature Control	430°C (800°F)	304°C (580°F)	371°C (700°F)

Insulation Resistance 100Ω

10% OFF ALL FLUKE INSTRUMENTS

SOLDERING IRONS

- Compact, lightweight design with a slender handle for a more comfortable grip.
- Rod-type ceramic heater brings high insulation, and reduces the handle-to-tip distance for faster soldering with a minimum of movement.
- Special alloy heating element protects the heating element from oxidation, and ensures years of trouble-free use.

HAKKO

Model No.	N452JN-V12	N453JN-V12	N454JN-V12
Power Consumption	15W	20W	25W
Heating Element		Ceramic Heater	
Maximum Temperature	370°C (698°F)	420°C (788°F)	450°C (842°F)
PRICE	$22.95	$23.95	$24.95

BK PRECISION

- AUTO/NORM triggered sweep operation with AC TVR TW and line coupling
- x10 magnifier
- Bright, sharp rectangular CRT with P3331 phosphor
- X-Y operation
- Front panel trace rotation control
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- Selectable +/slope + Built in calibration source
- Compact low profile design

20MHz DUAL-TRACE OSCILLOSCOPE BK-2120

- Dual or Single Trace Operation
- +1mV/Div Sensitivity
- 20MHz Response at a true 3DB

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1 MEG x 9 - 80 NS	SIMM/SIP	$51.95
4 MEG x 9 - 80 NS		$299
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FOR MAC PLUS, SE, SE/30, MAC II, CI, CX, SI

256K x 8 - 100 NS	$10.99
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BK PRECISION

- Z axis input
- x10 sweep magnification
- Single sweep
- V mode - displays two signals unrelated in frequency
- Channel 1 output

40 MHz DUAL-TRACE OSCILLOSCOPE BK-1541

- 1 mV/div sensitivity
- 20 calibrated sweeps
- Video sync separators

$589

intel **MATH COPROCESSORS**

8087		
5MHz $85	8MHz $117	10MHz $159
80287	XL/XLT	$199
80387		
16MHz $329	20MHz $349	25MHz $469
33MHz $569	SX16 $299	SX20 $349

BK PRECISION

- 1 mV/div sensitivity
- Sweep to 5 ns/div
- 22 calibrated ranges - main time base
- 19 calibrated ranges -delayed time base
- Signal delay line
- V mode - displays two signals unrelated in frequency
- Component Tester
- Z axis input
- Single sweep

65 MHz DUAL-TRACE DUAL TIME BASE OSCILLOSCOPE BK-2160

$895

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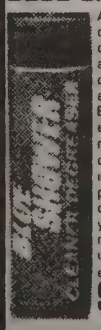
BLUE SHOWER



A tough cleaner and degreaser for all electronic components and circuitry. Effective enough to remove organic, inorganic and particulate contamination, yet safe on most plastics used in electronics.

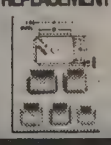
$7.99 REG $9.99

HAKKO FLAT PACK DESOLDERING

- Economical iron for desoldering flat packages
- The ceramic heating element provides faster heat transmission and excellent insulation
- An insulation factor of over 100 MΩ can be maintained even during actual use

Tip not included

REPLACEMENT TIPS



$46.95

#1541481

Model No.	924M-V12
Power Consumption	85W
Temperature Control	304°C (580°F)
Insulation Resistance	Over 100MΩ

THE CLEAR BUSINESS DECISION FOR SERVICE, SELECTION AND SAVINGS IS Fry's ELECTRONICS

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17BII	$79.95	28S	$179.95
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HP MEANS QUALITY

Panasonic
DESKTOP FEATURE PHONE

For the office or home, this phone has all the features you need. It has a K-size handset, 28 station automatic dialer, hold button, and much more.

HOT LOW PRICE

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MODEL KX-T2310

SONY.
SPEAKERPHONE

From the leader in cordless phone technology comes a new line of feature phones. This unit has a crystal clear speakerphone, 32 number memory and more!

SONY... simply the BEST!

$57.95

MODEL IT-D100

FUNAI
FAX MACHINE

HURRY LIMITED SUPPLY!

If your needs include sending five pages of text at one time, fine text sending and receivability, don't go broke. Do it with this quality Fax machine for just...

MODEL FAX-1000

5 PAGE FEEDER!

HOT LOW PRICE

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AT&T
MICROCASSETTE ANSWERING MACHINE

AT&T'S single microcassette answering machine. This affordable unit features call screening, message indicator, a 7 foot power cord and memo recording.

AT&T QUALITY!

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MODEL 1301

PHONE-MATE.
THE ANSWERING MACHINE THAT TALKS TO YOU!

When you call in to retrieve your messages remotely this hot unit tells you exactly what to do! The voice walks you through the beeperless remote function and even tells when the call came in!

Voice Time & Day Stamp

$69.95

MODEL 4300

MURATA
COMPACT FAX WITH TELEPHONE

This machine features Group-3 compatibility, fast transmission time, crisp images and 20 speed dial numbers. Automatic paper cutter crops messages & copier into individual pages. Can be used as a phone or a fax! !

$438

MODEL M-1100

PHONE-MATE.
FAX, TELEPHONE WITH ANSWERING MACHINE JACK

This hard working unit has a 7 page Automatic Document feeder and stores up to 50 telephone numbers.

$478

MODEL FAX 600

EPSON
FAX MACHINE

Epson gives you big features for less money. This unit boasts 28 pages of internal memory in case you run of out of paper, and you can also broadcast from memory. 5 page feeder, half-tone transmission and even a paper cutter!

$598

MODEL FAX 3000

SHARP.
FAX MACHINE with SPEAKERPHONE

This new unit features a 10 page document feeder, 60 number memory, automatic paper cutter, broadcasting, 16 level gray scale and is Group 3 compatable

PAPER CUTTER

$869

MODEL FO-334

SHARP.
ADDING MACHINE CALCULATOR

Now you can own a 10-Digit Adding Machine/Calculator from the Leader in Calculators...SHARP. Plugs into AC and uses Standard Paper.

$54.95

Model EL-1197

CASIO
B.O.S.S.

In today's world it is so important to remain organized, and Casio has the 90's answer to this problem. With this electronic organizer, you can keep notes, telephones numbers, plan your calendar and more!

Interfaces with MAC or IBM computer!

$177

Model SF8000

SONY.
COMPACT TRANSCRIBER

Sony's compact desktop transcriber has the most popular features. It offers foot pedal operation with 3-position backspace, 2-speed operation, telephone recording jack, conference recording and much more. It even comes with a headset!

$197

Model M-2000

Franklin
SPEAKING DICTIONARY

Imagine, the power of words at your fingertips! at the touch of a button, the LANGUAGE MASTER gives you ready reference to correct spelling, definitions and synonyms for over 83,000 words from Merriam-Webster's Dictionary. Speech technology allows it to pronounce all words before your eyes and ears.

$199

MODEL LM-4000

SONY.
PORTABLE RADIO

Now you can have this hot portable AM/FM radio with cassette for amazingly low, low price of . . .

$29.95

MODEL CFM-130

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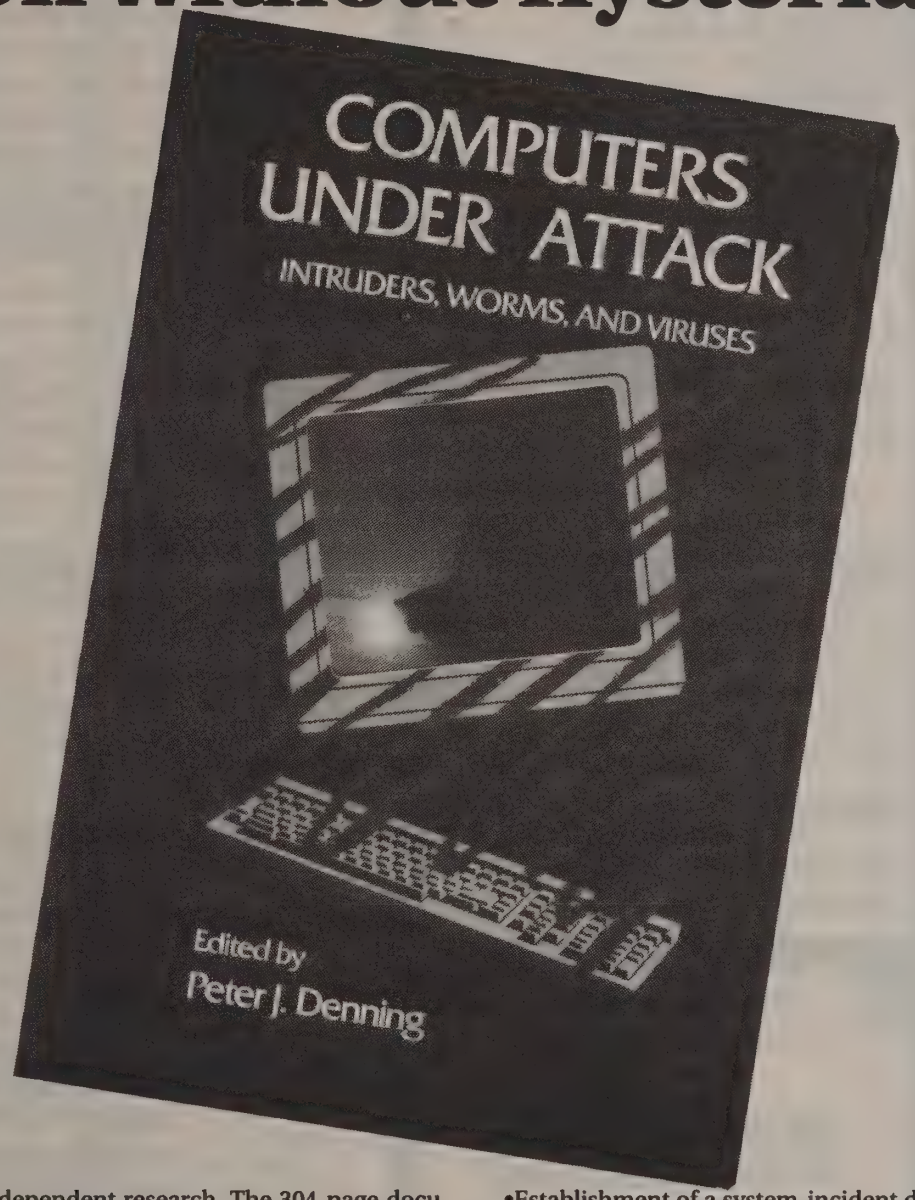
If you're interested in the subject of computer security but confused by the conflicting viewpoints and inflammatory attitudes it seems to engender, two recent books provide an in-depth look at the issue, noting problems and suggesting solutions.



COMPUTERS AT RISK

In the general climate of hysteria surrounding such matters as Robert Morris's Internet worm, the *Cuckoo's Egg* episode, Operation Sun Devil, and other security crises, it isn't surprising that last December, when the National Research Council issued the 304-page report, *Computers at Risk: Safe Computing in the Information Age* (National Academy Press, $19.95), press coverage tended to dwell on the sensational aspects of the report and simply rehashed those high profile cases enumerated in the document.

However, the book deserves much more than that. The report was prepared in response to a 1988 request to the Computer Science and Technology Board of the National Research Council by the Defense Advanced Research Projects Agency (DARPA), asking it, as the book's preface says, to "develop a national agenda for policy, engineering and research to help the United States achieve a safer, more reliable and secure computing base by the end of the decade."

With this broad-based charter, the Computer Science and Technology Board formed the System Security Study Committee under the chairmanship of David D. Clark, senior research scientist at the Massachusetts Institute of Technology, and asked it to perform the necessary work to respond to the DARPA request.

The committee was drawn from a wide spectrum of the data processing community, including security professionals, academics, scientists, and top-level executives. The committee met several times over a year and a half, and the report reflects a broad range of material brought to it through its members' independent research. The 304-page document reflects the committee's consensus, stated by Clark in his announcement of the report, "that national computing and communications systems are vulnerable to potentially catastrophic security breaches and accidental failures." To combat this vulnerability, the committee makes recommendations in six areas:

•Promulgation of a comprehensive set of Generally Accepted System Security Principles, referred to as GSSP, which would provide a clear articulation of essential security features, assurances and practices.

•A set of short-term actions for systems vendors and users that build on readily available capabilities and would yield immediate benefits.

•Establishment of a system-incident data repository and appropriate education and training programs to promote public awareness.

•Clarification of export control criteria and procedures for secure or trusted systems and review for possible relaxation of controls on the export of implementations of the Data Encryption Standard (DES).

•Funding and directions for a comprehensive program of research.

•Establishment of a new organization to nurture the development, commercialization, and proper use of trust technology, referred to as the Information Security Foundation, or ISF.

The remainder of the report provides the background underlying the committee's

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contention that the existing security systems are inadequate and explains in depth the recommendations enumerated above.

The most controversial and far-reaching recommendation suggests the establishment of a new private organization, ISF, to perform the activities necessary to insure a dramatic improvement in the area of security. The organization envisioned by the committee is not-for-profit and independent of the government bureaucracy, a recommendation which we doubt will endear the notion to members of the government data processing establishment.

In developing the case for such an organization, the report first points out why it feels that the existing structural approach to data processing security is flawed, and goes on to explain its conclusion that the answer is not simply in patching the existing structure. Finally, it spells out why, in its collective judgment, the recommended organization not be placed within the framework of the government.

We believe *Computers at Risk* belongs on the bookshelf of anyone at all concerned with these issues. It makes a reasoned presentation of the very real security dangers inherent in our computer and communications system, and makes cogent recommendations.

The NCR's report concludes "that national computing and communications systems are vulnerable to potentially catastrophic security breaches and accidental failures."

COMPUTERS UNDER ATTACK

While *Computers at Risk* was a response to a government request and therefore has a specific mission, another recent work, *Computers Under Attack: Intruders, Worms, And Viruses*, edited by Peter J. Denning (ACM Press / Addison-Wesley Publishing Company, $20.50 to the general public; $18.50 to ACM members) attempts to provide the reader with a broad understanding of the problems and issues that exist in the area of computer security.

Computers Under Attack provides in-depth study of each of the issues it discusses: the forty articles in the 554-page work cover a good deal of ground. Denning divides the work into six sections, each of which is well explored through a variety of articles, many drawn from *Communications of the ACM* (of which Denning is editor-in-chief). The authors are a diverse lot and reflect Denning's commitment to seek "material from many different perspectives, including those of hackers."

The section headings provide an organized structure to the work: The Worldwide Network of Computers; Intruders; Worms; Viruses; Countercultures; and Social, Legal and Ethical Implications. In the preface, Denning encourages readers to view the book as a forum of speakers where an attendee might choose to listen in any order or depth sparked by her/his interest. Even if you only read a portion of the book, you'll probably feel that your investment has been rewarded.

Denning himself provides an excellent introduction to Section 1 with two articles, "Worldnet" and "The ARPANET After Twenty Years." Each subsequent section begins with pieces that set the tone for that particular topic—for example, Denning's introduction to the Worms section focuses attention on the worm released by Robert Morris, Jr., and the remainder of the section stays close to that subject; his thought-provoking "Moral Clarity in the Computer Age" introduces the last section.

Denning chose authors who write well and are known in the computer community, either as experts on a topic or as famous advocates of particular positions. They include Cliff Stoll, author of *The Cuckoo's Egg*; John S. Quarterman, author of *The Matrix*; Eugene H. Spafford; Richard M. Stallman, Donn B. Parker, and Dorothy Denning (well-known security expert and wife of Peter, interviewed in this month's cover story, whose two-way interview with "Frank Drake," the pseudonym used by the editor of the now-defunct publication, *W.O.R.M.*, is one of the book's high points).

The Denning book is much livelier than *Computers at Risk* simply because of the nature of the two works. Both books, however, are well worth reading and provide an important resource. ■

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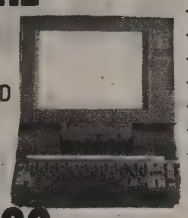

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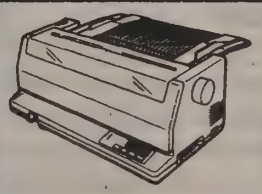

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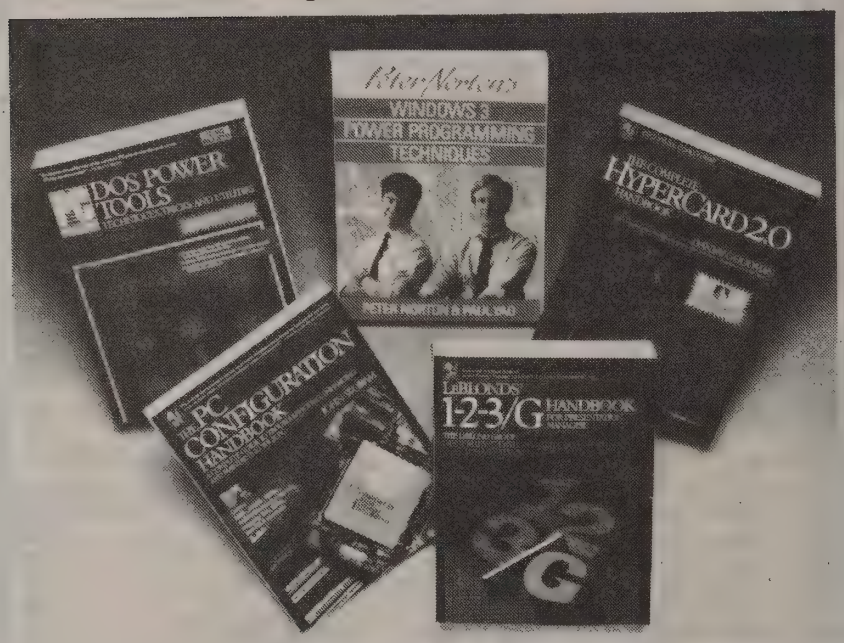

two new titles in the Bantam Power Tools Series, *1-2-3 Power Tools* and *Novell NetWare Power Tools.* Bantam is launching the Peter Norton Computing Series with *Peter Norton's Windows 3.0 Power Programming Techniques* and *Peter Norton's Official Guide to the Norton Utilities for the Macintosh.* For a complete catalogue and book information, contact: Bantam Electronic Publishing, Inc., 666 Fifth Ave., New York, NY 10103. 1-800-223-6834.

LOOKING PROFESSIONAL FROM THE DESKTOP

The Professional Look: The Complete Guide to Desktop Publishing, by Stephen E. Manousos and Scott W. Tilden, takes all the research of traditional publication design and applies it directly to work in desktop publishing. In discussing grids, for example, it tells how DTP software handles grids and how you can make the most of those capabilities. Individual chapters cover key considerations in choosing computers for DTP, traditional paste-

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PRODUCT UPDATES

➤**LanSoft v2.0**, from **Accton Technology Corp.**, offers many new features, including improved print spooler functions, an enhanced menuing system, and improved security and administration features. Accton Technology Corp., 46750 Fremont Blvd., #104, Fremont, CA 94538. (415)226-9800.

➤**The AG Group** has released **EtherPeek 1.2**, a new version of its Macintosh software tool for Ethernet and AppleTalk LAN analysis. Free upgrades are available to registered customers. The AG Group, 2540 Camino Diablo, Suite 202, Walnut Creek, CA 94596. (415)937-7900; AppleLink AG.Group.

➤**AutoShade v2** with **Autodesk RenderMan** is now available. A companion product to AutoCAD Release 10 and Release 11, the new AutoShade incorporates Pixar's PhotoRealistic RenderMan to create computer-generated images of AutoCAD 3D models. Autodesk, Inc., 2320 Marinship Way, Sausalito, CA 94965. (415)332-2344.

➤**Electronic Arts** released **Studio/8 2.0**, a revised and enhanced version for the new Macintosh IIsi and LC computers. The upgrade is available for $30. Electronic Arts, Inc., 1820 Gateway Dr., San Mateo, CA 94404. (415)571-7171.

➤**Nuvotech** announced four new upgrades to its current product line of Ethernet and LocalTalk connectivity products for the Apple Macintosh. **NuvoLink SC v1.3.1** software supports the newest Macintosh computers. **NuvoLink SC ROM v1.1r** allows heavier Ethernet traffic. **NuvoLink II v1.05** supports the Macintosh IIsi and IIfx. The **TurboStar** hardware upgrade improves performance in noisy LocalTalk networks and provides better operation with Apple products. All four upgrades are available free to current owners. Nuvotech, Inc., 2015 Bridgeway, Suite 204, Sausalito, CA 94965. 1-800-232-9922, (415)331-7815; AppleLink NUVOTECHHELP.

➤**Express Publishing 2.0**, from **Power Up Software Corp.**, has several new features that give users with no formal design experience the ability to easily produce high-quality documents. The upgrade for registered users is $34.95. Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. 1-800-851-2917.

➤**Spectrum HoloByte** has released **Flight of the Intruder 1.2.** A free upgrade is available to all registered owners. Graphics format and disk size information must be included with the request. Spectrum HoloByte, Inc., 2061 Challenger Dr., Alameda, CA 94501. (415)522-1164.

➤**QPlus released VenEdit 1.1**, the edit package designed for creating and editing text files for Ventura Publisher. QPlus, Inc., 2020 Beechwood Blvd., Pittsburgh, PA 15217. (415)521-9525.

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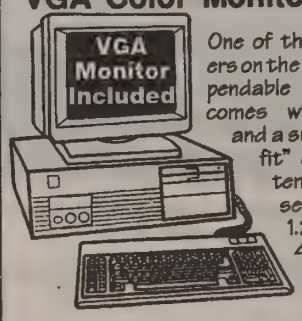

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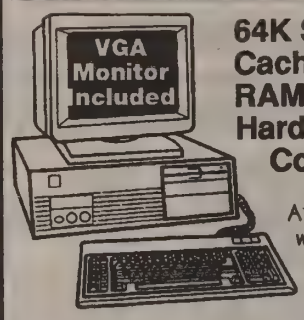

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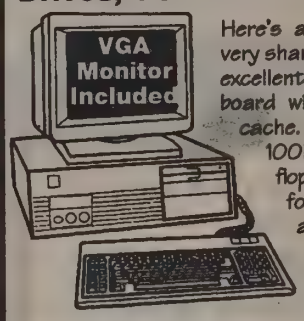

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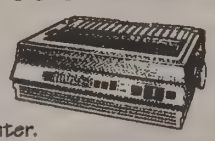

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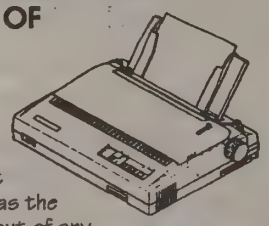

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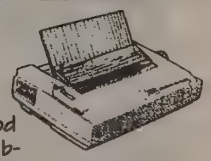

Our fastest dot matrix printer produces text and graphics that are good enough for desk top publishers. It's very fast (370 cps) easy to use, & perfect for high output users.

$349
$17/Month

COLOR UPGRADE AVAILABLE $75

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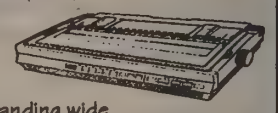
PANASONIC WIDE CARRIAGE 24-PIN PRINTER

LETTER QUALITY!



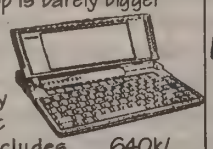
Here's a great buy on an outstanding wide carriage printer. It's easy to use, has excellent "letter quality" print, and an automatic self-loading tractor feed with paper parking. 2 Year Warranty!

Panasonic Office Automation

Call for Best Price

LAPTOP COMPUTERS

PANASONIC'S WONDERFUL NOTEBOOK COMPUTER

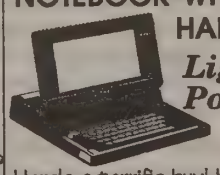


This tiny laptop is barely bigger than a notebook, but it's fast, fun, and has a new easy to read backlit screen. Includes 640k/ RAM, AC adaptor and battery charger, and DOS.

Panasonic Office Automation

Call for Best Price

BONDWELL 286 NOTEBOOK WITH 40 MB HARD DRIVE

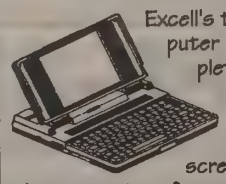


Light and Powerful

Here's a terrific buy! It weighs only 7 pounds, has a backlit screen, and 40 MB hard drive, and comes complete with an "extra' battery and external charger.

$1,299 $65 Month

EXCELL 286 NOTEBOOK WITH VGA SCREEN



Excell's tiny new computer comes complete with 20MB hard drive and a bright and sharp VGA screen. It's about the same size of a small notebook, but has all the power of the most popular desktop computers.

$1,899 $95/Month

TANDON 386SX LAPTOP COMPUTER

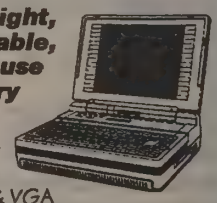
This is a really neat computer. Runs on AC or 3 hour batteries, has a terrific new VGA screen that refreshes itself in half the normal time. Includes 40MB hard drive and MS-DOS.

$2,199 $110/Month

Introductory Special!

EXCELL 386-SX LAPTOP w/120 MB HARD DRIVE

Lightweight, comfortable, easy to use and carry



120 Mb Hard Drive Removable keyboard & VGA screen. Includes 2 serial ports, 1 parallel, and the latest version of DOS.

$2,699 $135 Month

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Features, Halftones, 10 page document feeder, Phone/fax switch, and answering machine hook-up.

Works With Your Answering Machine

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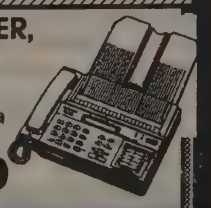
$25 Month

SHARP FAX WITH PAPER-CUTTER, AND 12 PAGE MEMORY



This unit is quick (13 sec), has a 12 page memory, papercutter, halftones, a phone/fax switch.

Works With Your Answering Machine

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If you have a problem with one of our computers we can usually have it fixed within 1 hour. It's important to us that our customers remain satisfied.

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You can defer payment for 90 days and pay no interest at all! Or you can charge it to your Uncle Ralph's credit card account.. Sometimes we even take cash! Subject to lender approval.

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We're open for you 7 days a week— til 8 pm Monday through Friday, and til 6 pm on weekends.

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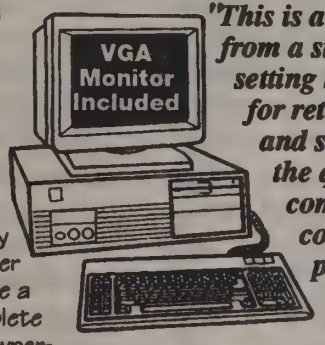
Static RAM Cache, 100MB Hard Drive, 4MB RAM, 2 Floppy Dirves, 1024x768 VGA Color Monitor & Tape Backup



"This is a fine machine from a store that is setting the standard for retail support and service ...Given the quality of the components, I consider the prices excellent."
Bernie Zilbergeld
Computer Currents

The OmniTel motherboard is making some big waves lately and we've packaged it with other excellent components to create a high performance system. Complete system includes hard drive, Viewperfect monitor, 512K VGA card, 100 MB tape backup, parallel, game, 2 serial ports, your choice of excellent keyboards. & DOS.

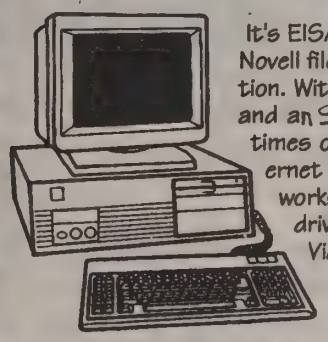
"Super Find"
S.F. Focus Magazine

Complete System Includes QA Plus & DOS

$3,195
$160 Month

UR/Mylex 486-33 EISA

THE FASTEST 486 COMPUTER ON THE MARKET



It's EISA bus makes it superior for use as a Unix or Novell file server, or as a high powered CAD workstation. With Mylex's (optional) caching controller card and an SCSI hard drive it can acheive disk access times of 0.2 MS. With Mylex's EISA (optinal) Ethernet Card it can double the speed of most networks. Base System includes 4 MB RAM, 2 floppy drives, serial and parallel ports, and keyboard. Video and Hard Drive separate.

"If I wanted to replace my entire system for optimum all around performance, I would build it from Mylex EISA based boards"
Michael N. George
Personal Workstation Magazine

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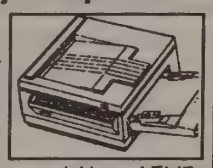

Quiet, small-footprint desktop printer with 24 resident fonts and 132 HP-compatible Bitstream softfonts. 300 dpi, 512K memory, expandable to 4.5MB. HP emulation and 2 cartridge slots.

EVEREX **$869** $43 Month

BROTHER'S TOP RATED LASER PRINTER

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This terrific laser printer has collected Editor's Choice awards from virtually all major computer mags. It runs on the reliable Canon engine, has eight major emulations including HP Laserjet II and HPGL, includes 44 resident fonts, enough memory to do full page graphics straight out of the box, and a super sharp image.

$1,299
$65/Month

SUPER-FAST EVEREX/ABATON POSTSCRIPT LASER PRINTER

This new introduction from Everex may be the best Postscript buy to date. Scales text fonts and graphics to any size with unusually sharp image, and unlike most postscript printers it's very fast.

— PC & Mac — **$1,699**

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EVEREX

Here's a terrific flatbed scanner with the superb clarity of 256 levels of true gray-scale scanning. Handles up to 8-1/2" x 14" images! For PC, PS/2, Mac and NeXT systems.

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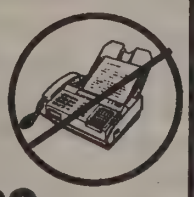

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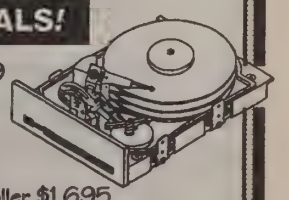
Hiundai VGA	$299
View Perfect 1024 x 768	~~$369~~ 399

HARD DRIVE SPECIALS!



Microscience 40 MB, 28 MS $219
Conner 100 MB $499
Maxtor 200 MB $829
Micropolis 150 MB ESDI $999
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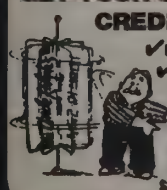

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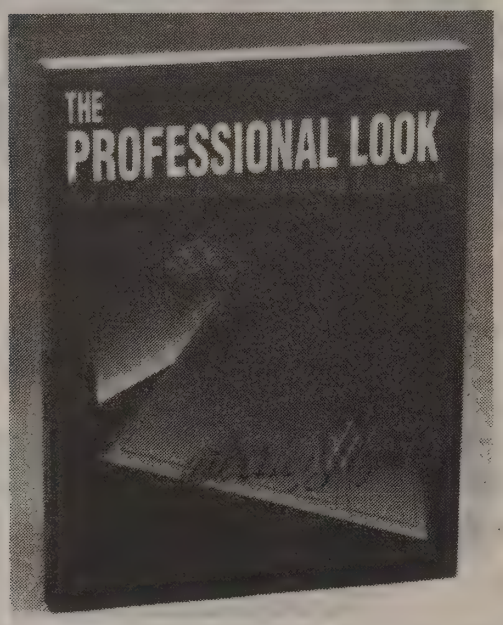


up techniques, as well as a look into how the authors see DTP affecting business operations. The authors discuss the different types of documents—such as newsletters, flyers, brochures, and books—and how they affect your work. ($19.95) Venture Perspectives Press, 4300 Stevens Creek Blvd., Suite 120, San Jose, CA 95129. (408)247-1325.

LAPTOP GUIDE

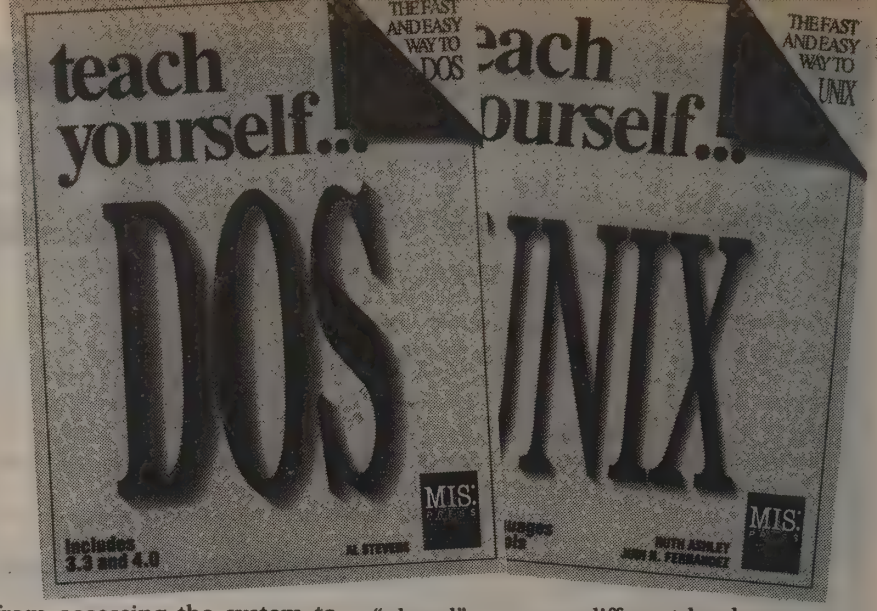
The Complete Laptop Computer Guide: How to Choose and Get the Most Out of Your Portable PC or Mac, by David H. Rothman, is written for everyone interested in buying or using a laptop. Written in a lively style, he tells of technological breakthroughs—by 1995 you'll pay less than $500 at K-Mart for a notebook-sized computer that can hold up to fifty thousand pages of information. For laptop users Rothman lists good, free programs and discusses eye strain from tiny laptop screens. For travellers, he tells how to hook up portables and send information back to headquarters through networks like CompuServe and MCI Mail. ($18.95 paperback) St. Martin's Press, 175 Fifth Ave., New York, NY 10010. (212)674-5151.

TEACH YOURSELF...DOS

Teach Yourself DOS quickly cuts through the computer documentation to reveal the capabilities and power of DOS. Author Al Stevens uses straightforward, non-technical language to present in-depth information on MS- and PC-DOS, formatting floppies and hard disks, and copying and managing files. The book is divided into sections, including DOS Commands, The Power User, Filters, Pipes and I/O Redirection, Batch Files and much more. ($19.95 paperback) MIS: Press, 524 N. Tillamook, Portland, OR 97227. (503)282-5215.

TEACH YOURSELF...UNIX

Teach Yourself UNIX, by Ruth Ashley and Judi N. Fernandez, may be the smallest UNIX training book ever written. In slightly over three hundred pages the authors offer a power-packed reference to anyone working in the UNIX environment. Incorporating online exercises, it quickly guides the reader through the fundamentals and on to doing complex tasks. UNIX users will learn everything from accessing the system to command entry syntax and common errors. Users will also learn to use UNIX file and directory management systems, master online communications, manage paths, and handle utilities. Programmers will find the in-depth information on Basic VI and other editors invaluable in writing and maintaining programs and documentation. ($24.95 paperback) MIS: Press, 524 N. Tillamook, Portland, OR 97227. (503)282-5215.



GAMES REVIEW

By Mike Markowitz

SIMEARTH—THE LIVING PLANET

Designed By: Will Wright and Fred Haslam
Published By: MAXIS
List Price: $69.95
For: Macintosh (color version requires 2Mb), IBM PC and compatibles (640K, supports Hercules, EGA, MCGA, VGA and Tandy graphics cards)

Now you can be the first one on your block to rule a world.

SimEarth is a planet simulator; a "software toy" that allows you to create a world and control its destiny. You can manipulate atmospheric, geological, and evolutionary variables to make your world a paradise for its resident SimEarthlings, or you can annihilate them with a few flicks of your divine mouse-button.

The design of SimEarth is based on the "Gaia hypothesis" of NASA scientist James Lovelock. This theory views the Earth and the living things on it as a single self-regulating system that maintains an optimum environment for life. Without the action of plants continually removing carbon dioxide from the atmosphere, for example, Earth might enter a runaway greenhouse effect, and wind up like Venus—hundreds of degrees hotter.

SimEarth is a complex program that can be "played" on many different levels—a geological time scale of billions of years, an evolutionary time scale of millions of years, a civilization time scale of thousands of years, or a technological time scale of decades. The ultimate "victory" is the emergence of a civilization advanced enough to leave the planet for interstellar migration. Almost any creature can evolve to become intelligent—there are fifteen classes of animals, each consisting of sixteen species. Plant life is modeled as a series of Biomes, ranging from desert to jungle. Your input is mediated through a series of control panels that let you alter global variables, like solar radiation, rainfall, volcanic activity, or animal reproduction. There is also an edit window that allows you to make local changes and stage events, like meteor impacts or hurricanes. You can view your planet as a flat map, or as a rotating globe.

You can choose a randomly generated planet, the early or present-day Earth, or one of several imaginary worlds with challenging problems. You can also try "terraforming" Venus or Mars to make them hospitable to life.

The 220-page manual is clearly written and packed with good information, despite a few typographical errors.

For greater speed the Macintosh version uses a palette of sixteen colors; rather than the standard 256, but it still looks spectacular. On a Mac IIci with 4Mb of memory, the program was impressively fast. SimEarth is a remarkable feat of programming.

It would be a wonderful supplement to any course in earth science or environmental issues. (MAXIS, Inc., 1042 Country Club Dr., Suite C, Moraga, CA 94556. 415/376-6434)

GALLEONS OF GLORY

Designed By: Gene Portwood, Lauren Elliott and Denis Friedman
Published By: Brøderbund
For: IBM PC (512K, VGA, EGA, Tandy, CGA or Hercules graphics)
List Price: $44.95

Between his departure from Seville in Au-

continued

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-Bernie Zilbergeld,
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We can deliver your new systems in no time. We can set them up for you, and we can even run training classes to help get all of your people up to speed.

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If you ever do have a problem, we can come to you, you can come to us, or we'll diagnose the problem over the phone and express you replacement parts.

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We work with some of the best companies in the country to satisfy your financing needs. We accept government purchase orders

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Our service department and sales consultants work long hours to ensure that we'll be available when you need us. Problems don't keep bankers hours ... and neither do we!

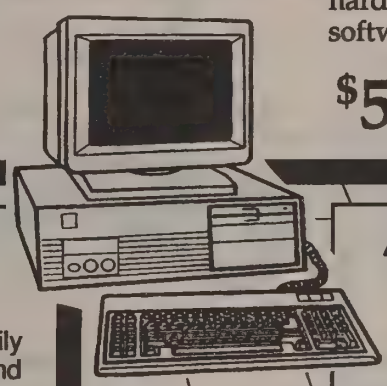
Turnkey Networking Services

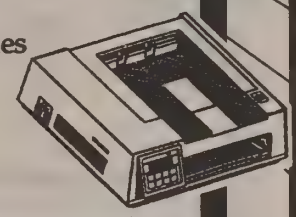
THE COMPLETE SMALL OFFICE SYSTEM

Three Networked Computers with Laser Printer

Expandable to 10 Workstations

Here's everything you need for a completely networked three workstation office. The main file-server is a 20 Mhz 386SX computer with 4MB RAM and a 100MB hard drive. The remote units are 16Mhz 386sx computers each with 2MB RAM and their own 40MB hard drives. All data can be shared by all users, or you can password protect confidential information.





System includes OKI Laser Printer and all necessary hardware and software (except cabling).

$5799 **$289 Month**

Midsized Office Server

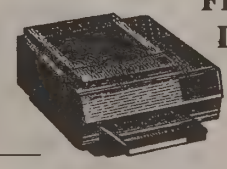
A robust file server that can easily support up to 16 stations now and grow in the future. It includes the acclaimed OmniTel 33Mhz 386 motherboard, tape backup, 4MB RAM, and a very fast Maxtor 200MB hard drive. Lantastic Lan Card and networking software is also included.

$215 Month **$4299**

486 Novell Power Server

486 based file server with 350MB hard drive that's designed to support networks of 32 workstations with room to spare. Includes tape backup, 16MB RAM, Mylex EISA and Ethernet Card. EISA systems also available.

$5999 **$299 Month**



FREE LASERJET III LASERPRINTER

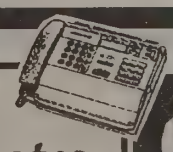
Buy any UR file server and ten workstations and get a Hewlett Packard Laserjet III at no extra charge!

UR 386SX LANStation

Cost effective workstation for connecting to your LAN, able to support any of today's powerful software, or even serve as a secondary server. Includes 2MB RAM, 40 MB hard drive, monochrome monitor, and Lantastic LAN card.

$1699 **$85 Month**

TURN ANY EXISTING PC INTO A LANTASTIC LANstation **$299**



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DOS Full	819	
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SQL DEV	735	CALL
DOS RT	145	
DOS DEV	589	

	386 UNIX	WORKSTATION
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WordPerfect 5.0		
SU	249	329
5U	499	CALL
20U	1299	CALL
Frame		
Framemaker	775	775
XWindows ver.	1899	1899

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UNIX 386 O/S ULTD	729	649
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VP/IX 386 ULTD	689	649
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Aetech ADA Assembler	755	CALL
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Faircom c-tree Plus	459	459
Faircom r-tree	239	239
Greenleaf Libraries	CALL	CALL
Interwork by Block Island	299	CALL
M++ by Diad Software	659	769
w/Source	929	1149
w/Modules	899	1079
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Vitamin C	CALL	CALL
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For Motif	849	1699
EDIX by Emerging Tech	399	399
EDT+ by BBC	439	CALL
VEDIT by Greenview	149	149
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gust, 1519 and his death in the Philippines in May, 1520, Ferdinand Magellan sailed over 15,000 miles on five galleons. This game simulates that voyage, although your mileage may differ.

Galleons of Glory is actually a game of managerial decision making. As admiral Magellan you must interact with key subordinates—your ship's captain, navigator, bosun, priest, carpenter, gunner, doctor and cook.

Your goal is to find a passage from the Atlantic to the Pacific and the fabled wealth of the Indies. You have to overcome storms, mutiny, hostile natives, and other challenges to survive. Each time you play the game a new coastline and set of events are generated.

Galleons uses a simple menu-driven interface that works equally well with mouse or keyboard. The graphics are attractive and effective even in CGA mode. An automatic installer makes it simple to copy the program from two 5.25" disks or a single 3.5" floppy onto your

Your goal in Galleons is to find a passage from the Atlantic to the Pacific and the fabled wealth of the Indies. Each time you play the game a new coastline and set of events are generated.

hard disk. The 43-page manual provides the full historical background, including a complete roster of the 256-man expedition (which also serves as the basis for off-disk copy-protection).

A simple game of modest proportions, Galleons of Glory runs acceptably on PC-XT class systems. An Apple II version is under development. Highly recommended for anyone with an interest in the Age of Exploration, sailing ships, or plain old puzzle-solving entertainment. (Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903. 415/492-3200)

OMAHA POKER 1.0

Designed And Programmed By: Jim Houha
For: IBM PC and compatibles (256K) not copy protected
List Price: $79 plus $3 shipping and handling

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Each player is dealt four cards. Up to eleven players can sit at the table. During the game, five cards are dealt onto the table for all to use. The table cards are dealt in three groups—three, one and one, with rounds of betting in between. You make a hand using exactly three cards from

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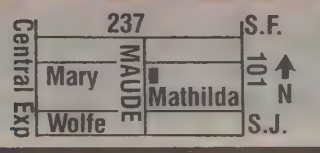

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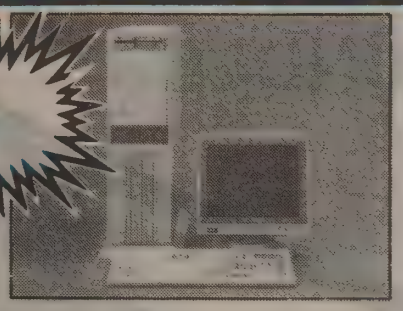

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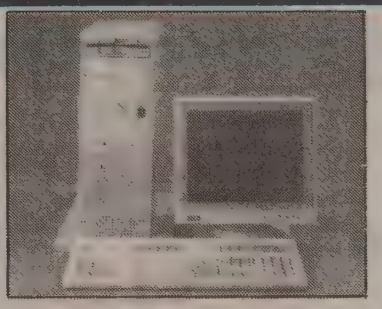

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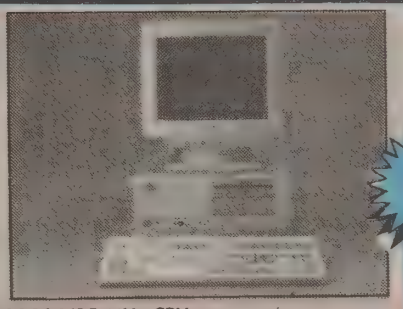

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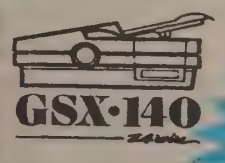

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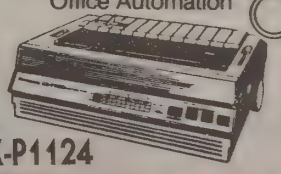

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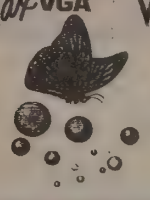

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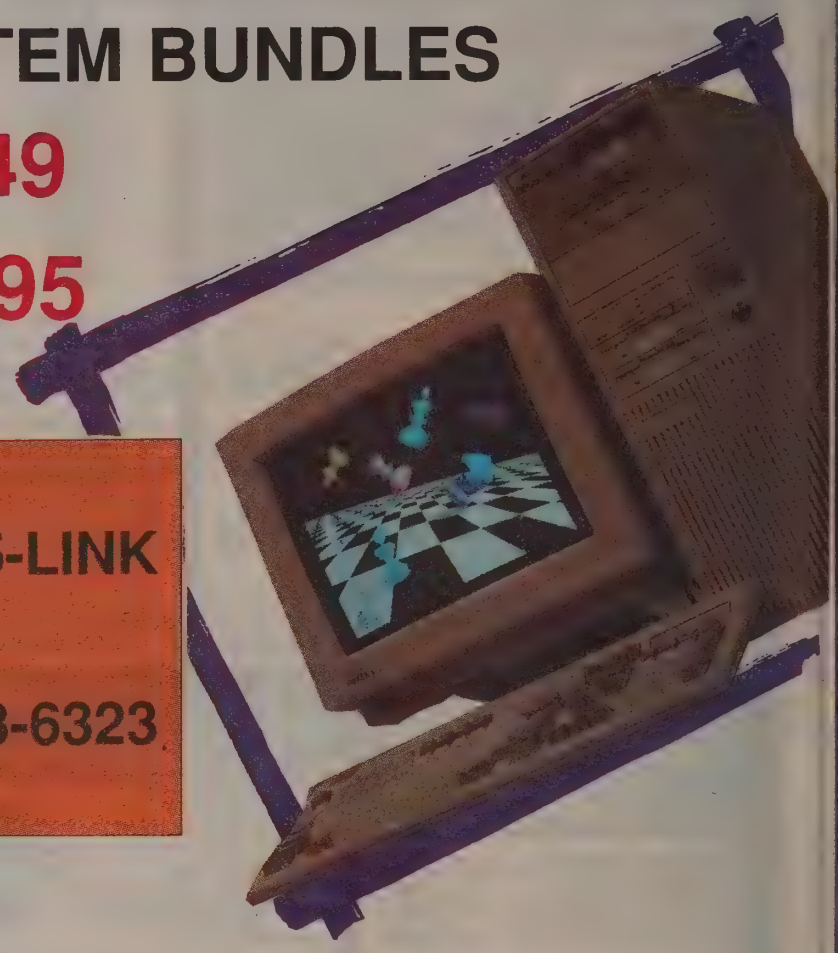

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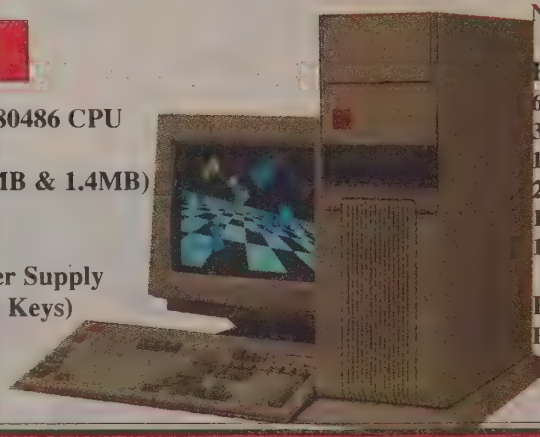

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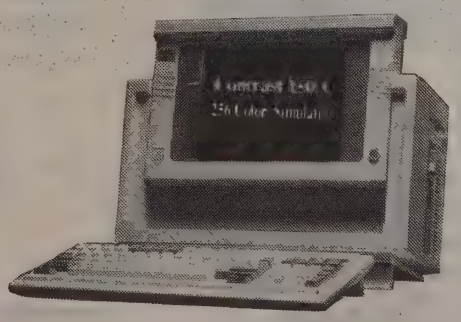

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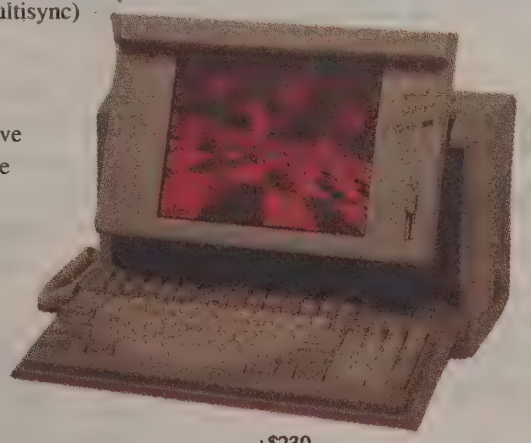

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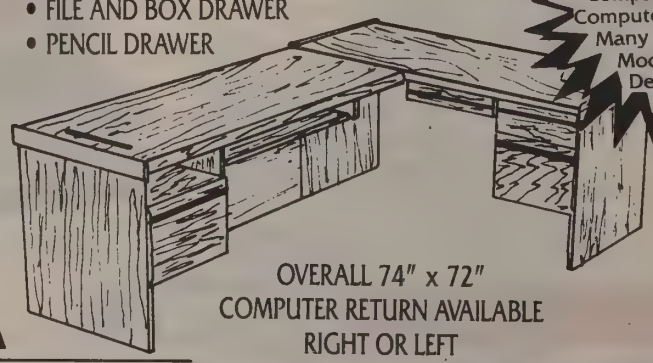

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PRODUCT SPOTLIGHT

the table and two of your own cards.

An extensive online help system guides beginners through the arcane rules of Omaha. The game uses simple character-based graphics (didn't you wonder why the heart, spade, diamond and club are included in the IBM extended character set?). The game automatically selects the best available graphics mode on your system. The programmer has been diligent about fixing bugs found in beta-testing. An 8-page leaflet provides all the information you need to get started.

It's good to see individual programmers, without massive commercial support or marketing investments, producing such high-quality special-interest games. Products like Omaha Poker deserve more attention and encouragement. (Jim Houha, 4062 23rd St., San Francisco, CA 94114)

It's good to see individual programmers, without massive commercial support or marketing investments, producing such high-quality special-interest games.

MACINTOSH SOFTWARE

MICROPHONE II V3.0

Published By: Software Ventures
For: Macintosh
List Price: $295
Reviewed By: Mary Eisenhart

MicroPhone has been my telecommunication program of choice since I was running version 1.0 on my old 512. In its first version,

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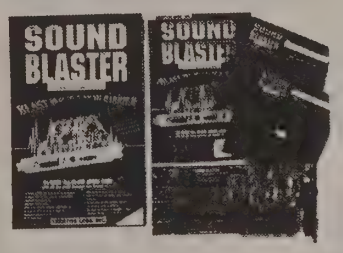

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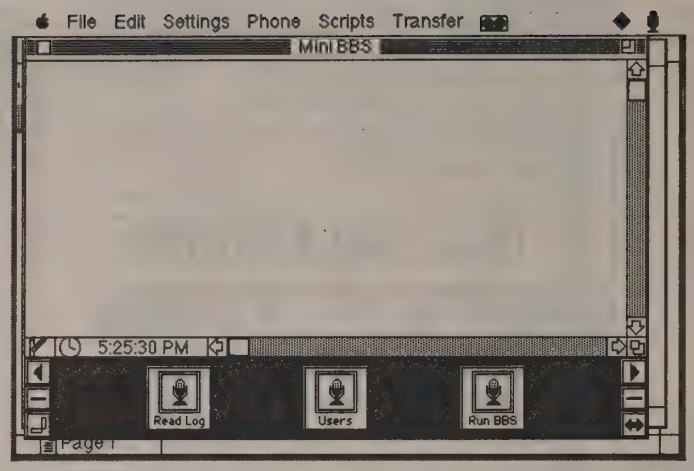

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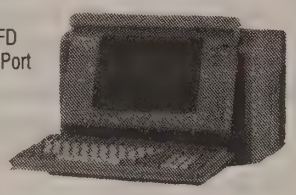

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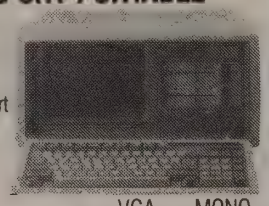

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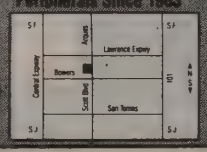

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it struck a nice balance between providing the convenience Mac users expect and cushioning the shock when said users discover that it's a rare BBS or conferencing system that follows Apple's Interface Guidelines.

If *you're* running an old 512, or even a 128K Mac, Software Ventures still supports version 1, now upgraded to 1.5. It sells for $99, and if all you use your modem for is calling the occasional BBS or downloading your mail once a month, it's probably plenty.

But if you fancy yourself a Power User, or if you spend substantial portions of your life online moving information around, or if you're a consultant trying to create a custom telecommunication system for relatively naive users, MicroPhone II v3.0 is the package for you.

It's doubtful that anyone could possibly use all the features and gadgets included in the current version, which is as much toolkit as application. Depending on your particular task, however, it's pretty likely that a few of them will render themselves absolutely necessary. Version 3 added a host of capabilities to the earlier MicroPhone II, many of which I've never used—I have yet to require a ZMODEM file transfer, for instance, but it's *de rigueur* to serious file transfer mavens in the PC world. When I went back to using the old (and discontinued) version to see what I missed most, it turned out to be relatively silly things like the clock at the bottom of the window (the Alarm Clock DA doesn't work too well on a 9" screen) and the STOP button, for those automated functions that don't turn out to be such a good idea. I also enjoyed being able to have my Mac II sessions appear in blue type (if you want to do yellow-on-magenta, you can do that too). The point, however, is that the package gives you all the resources you're likely to need to configure your personal cockpit for navigating the online universe—a powerful scripting language, buttons, icons, etc. You might not even have to do much construction—the package includes an assortment of scripts for popular services like MCI Mail and Dow Jones, so once you've got your passwords and local phone numbers plugged in, you could theoretically click a few icons and go for coffee (or diligently work on something else under MultiFinder) while your Mac picks up your mail and sends out your various messages to assorted recipients. (Alas, scripts are remarkably literal-minded creatures, though, and a bad burst of line noise or anything else unexpected more or less brings them to a screeching halt. Not even Software Ventures has found a cure for this problem, but its hardworking tech support department not only answers its phones but frequents online systems answering questions

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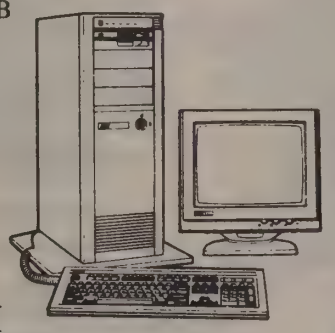

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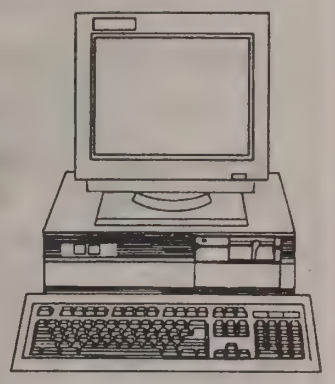

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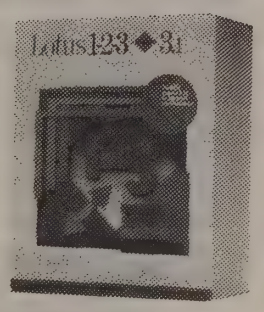

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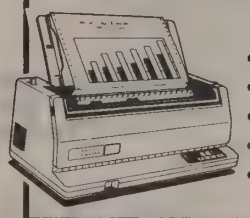

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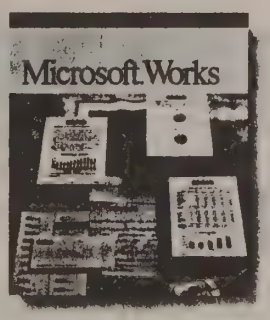

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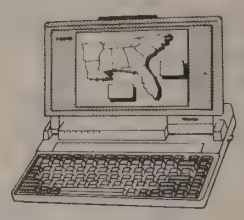

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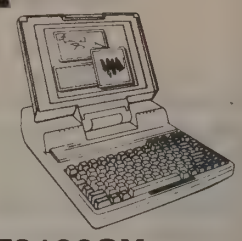

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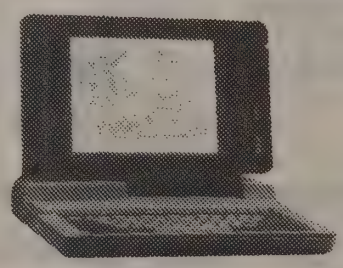

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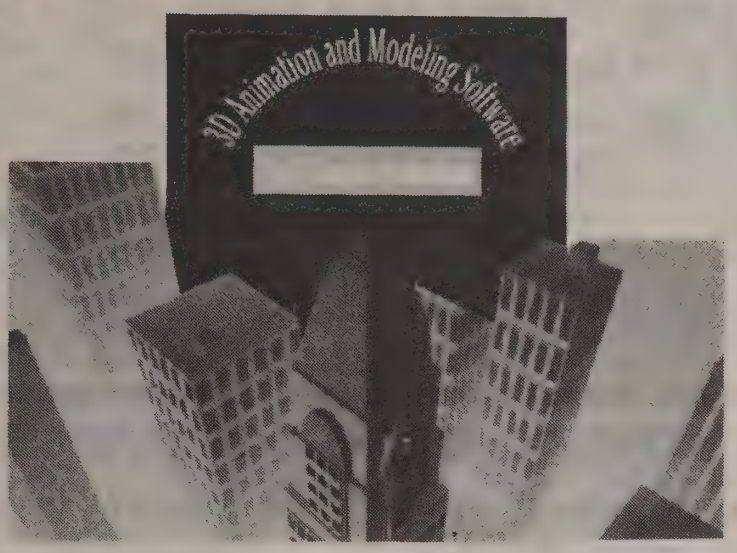

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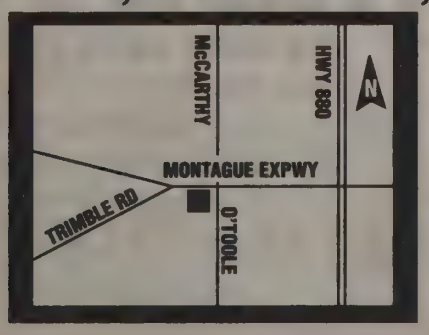

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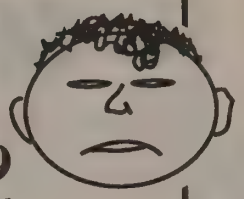

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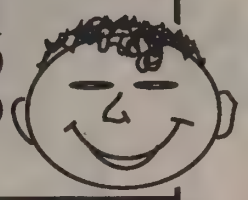

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and dispensing advice, and thereby does a pretty effective ad-hoc job of script-debugging.)

Most of what I do with MicroPhone doesn't strain its capabilities at all, but it leaves me very happy to have such a useful and flexible tool. At this point in the evolution of *MicroTimes*, nearly all our stories come in via modem. If a writer wants to send me a file directly, it's easy, using either ascii-capture or XMODEM. What's likelier to happen, though, is that several writers will have left their work for me on, say, The WELL (for which scripts are included, incidentally). So Ed, for instance, who tends to use PCs, will usually have an ascii file in his directory, which I just capture as it scrolls by. Matthew, on the other hand, has a nicely formatted column in MS Word 4, so I download that using XMODEM Macbinary. Somebody else sends me email about the vendor's address he forgot to include in his review, so I select it and, using one of MPhone's best features, append it to the existing file (lots of packages let you overwrite existing files, but very few let you add to them). A reader sends more email updating his BBS listing; I select the text, choose Print Selection, and hand it to Michael for the BBS database (I could, of course, QuickMail it to him too). I'm reading a conference and run across a posting that would interest Paul, and it's a simple copy-and-paste to pass it along to him.

Many Mac users, myself among them most of the time, don't particularly want to deal with the nuts and bolts of telecommunication, and whatever that mainframe is throwing at us, we don't want to know about it. MicroPhone does a very effective job of performing useful functions while shielding us from gory details—and also stays out of the way enough so that we can sometimes get at the problem and figure it out instead of contemplating a pretty—and frozen—dialog box. Also, since many of the systems you're likely to call are expecting to talk to glorified typewriters, MicroPhone does a variety of well-behaved terminal emulations, so that if, for instance, the system you're on expects you to use vi for your screen editor (and you actually know how to use vi), you can do it. You can do split-screen Talk on UNIX systems. Now if only it had a tutorial for that bone-headed text editor on MCI...

Good news if you're trying to set up telecommunications in a multivendor environment—MicroPhone is now available in versions for Windows and NeXT (which probably portends a crop of UNIX versions for the future), so you can have the same interface running on different platforms. Currently scripts created in one version can usually be executed by another, though according to Software Ventures, the Windows environment does introduce a few anomalies that they're working on.

If you're just starting out in telecomm and don't have a more knowledgeable friend to call on, you might find Version 3 so feature-laden as to be overwhelming, and you might find it easier to start with the bare-bones 1.5 until you learn the ropes and figure out what you really need. But if you're having somebody else set up what you hope is going to be an easy, automated way for you to access online information and communicate via modem, this package is worth the investment.

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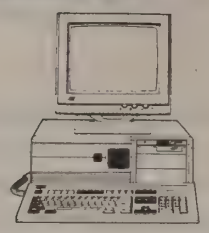

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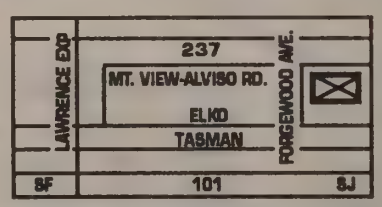

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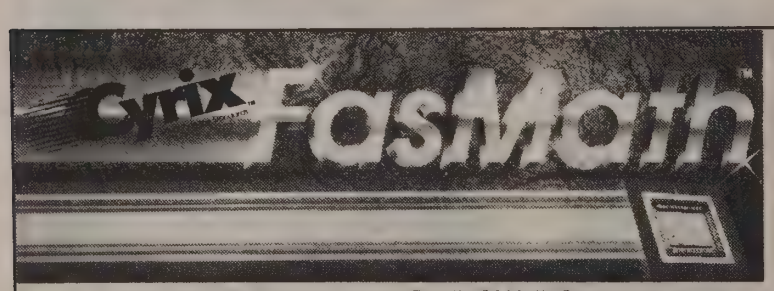

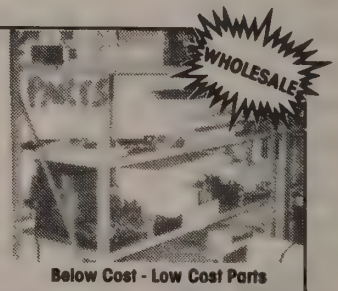

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HARDWARE REVIEW

DYNABOOK 286/20 PORTABLE COMPUTER

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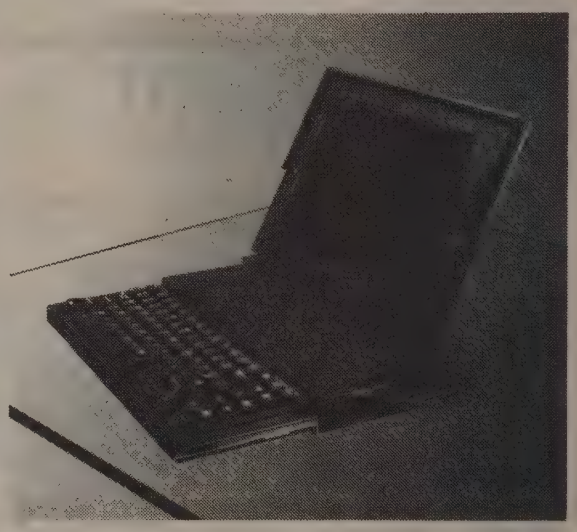
List Price: $3325
Reviewed By: Paula Martin

I picked up the Dynabook in its leather carrying case en route to the airport on my way to a software conference. When I arrived, I attached the flat "slice" battery, took the online SmartStart tour of the system, and I was in business. A Dynabook 286 was the only computer I used for the next two weeks. Very little adjustment was required to touch-type on the full-size keyboard.



The first day of the conference, I lugged the Dynabook to several sessions to take notes. By evening, my shoulder and neck ached. Although it's only 2.4" thick and the size of a notebook, with battery the Dynabook weighs over 14 lbs. It would have been easier to manage if it possessed a handle—dragging it out of the carrying case by my fingers was a chore. After the first day, the computer stayed in my room.

After returning home, I was especially pleased to be able to retreat to my overstuffed chair to do my work. I could think and work in complete comfort, with my full-function computer nestled on my lap. Wonderful! Then, at the office, I just plugged in the power adapter (which recharged the battery) and the printer cable, and I was ready to work. The monochrome VGA screen

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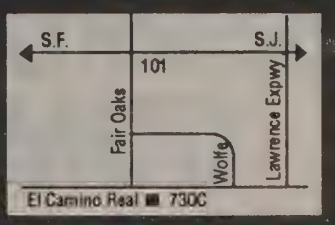

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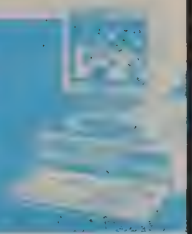

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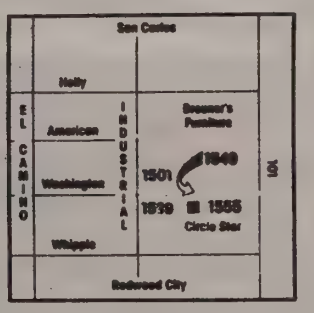

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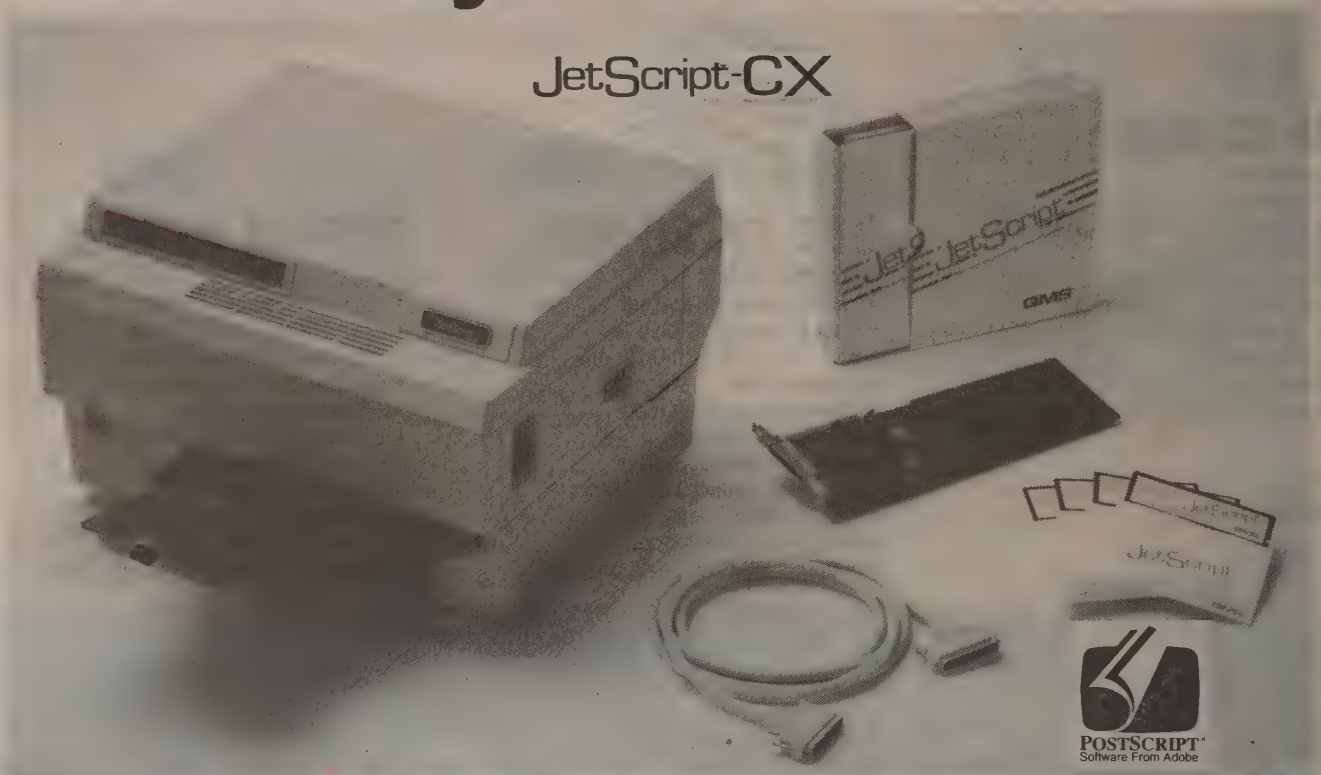

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was easy to read even under fluorescent lights and in front of picture windows.

It was acceptably fast—almost like using my desktop 20MHz 386. The Dynabook was designed to be your only computer, for home, office, and travel. Used as such, it is cost-effective, since it takes the place of both a desktop and a portable. With the exception of the absent separate numeric keypad and carrying handle, and the machine's considerable weight, I found the Dynabook as easy to live with as a desktop machine, with the bonus of portability. (SCI Manufacturing, Inc., 13000 S. Memorial Pkwy., Huntsville, AL 35803. 205/882-4107)

MAC HARDWARE

MACTRAC

Manufactured By: MicroSpeed
List Price: $119 for the ADB version and $99 for the DB9 version
Reviewed By: Michael Robin

Conceptually, I have always liked trackballs. They seem perfect for me. My desk is always overcrowded—the computer, hard disk, telephone, stapler, files, papers, magazines, etc. Plus, notes and messages always seem to find a way under the mouse pad, making the pad both lumpy and slippery.

While I have liked the idea, I have never really liked using a track-

ball.

So, always willing to try something new, I decided to give the MicroSpeed MacTrac trackball a spin. Expecting nothing significantly new, I was surprised. MacTrac has an excellent design, making it both easy to use and even easier to adjust to.

The first adjustment to make when using a trackball is that you don't move it like a mouse. This may sound simple, but after using a mouse every day, my instinct is to move a mouse to move the cursor. It felt like MicroSpeed knew this when they built the MacTrac. With my hand resting on it, MacTrac sits securely on the table top and didn't budge when I tried to move it like a mouse.

MacTrac has three buttons—left, center and right—surrounding the ball. The left and right buttons act like regular buttons on any Macintosh mouse. They are big enough to reach with any finger, and work just as easily for left- or right-handed users. The third button, also known as a drag lock button, is smaller, sitting in the center above the ball. Activating this button is similar to holding down a button while selecting text or scrolling through a menu. At first I did not use the lock very much. But after a short time, I began, almost

Continued on page 168

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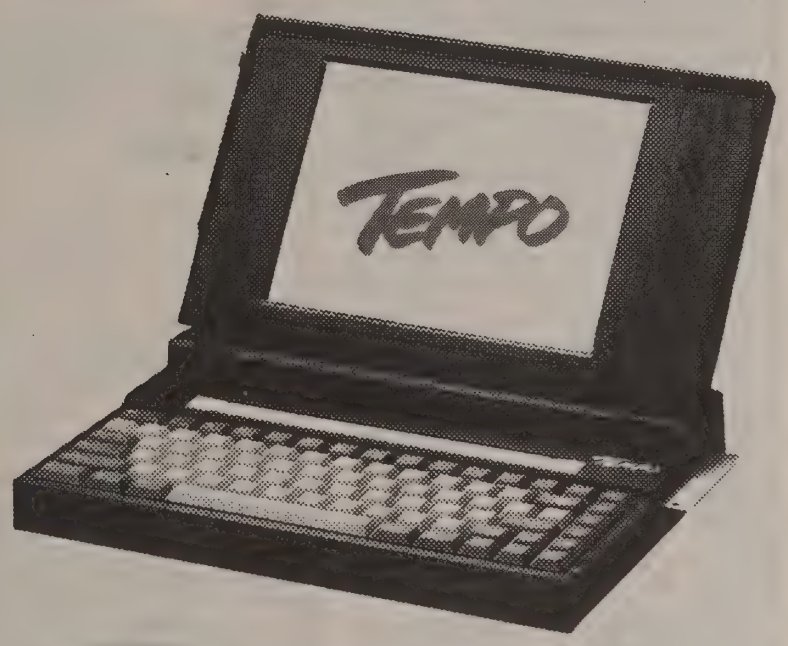

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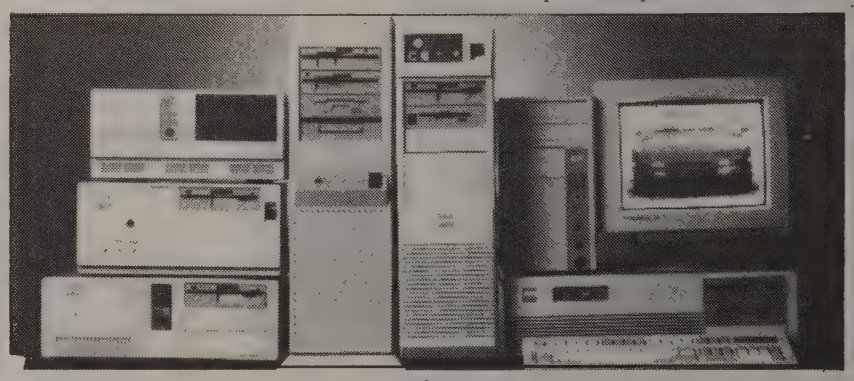

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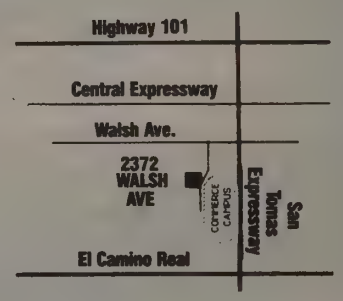

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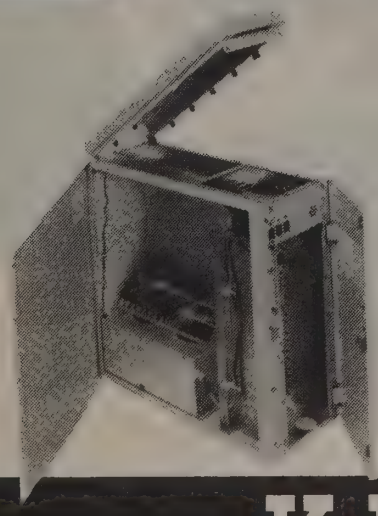

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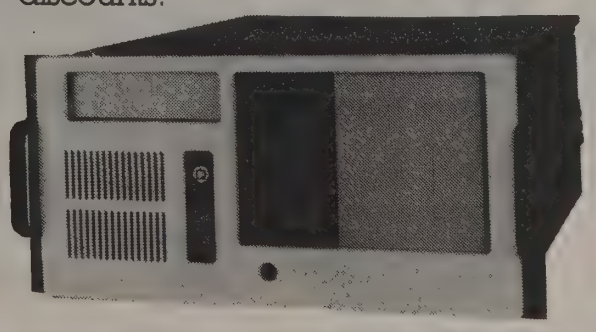

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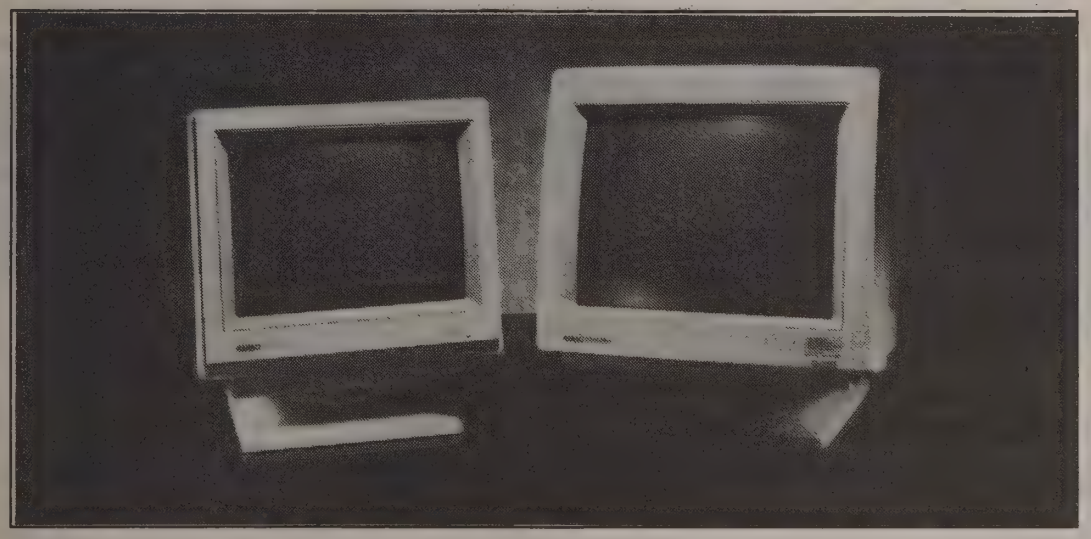

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Continued from page 162

unconsciously, to reach for this button.

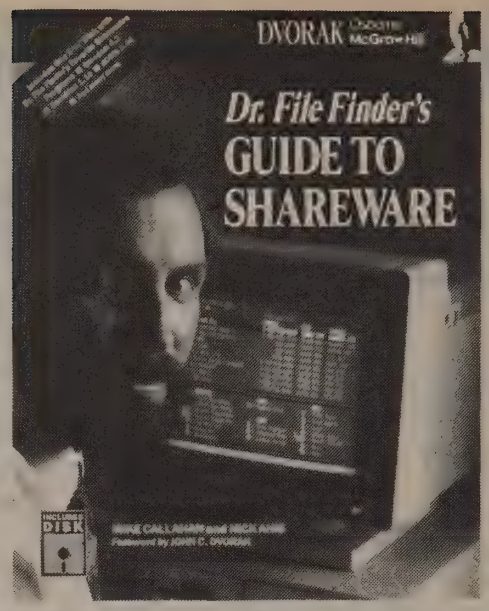
A note of warning. Trackballs and mice use different methods to control the cursor on the screen. There are several INITs that work with a mouse, making it more sensitive and quicker. These may conflict with MacTrac and cause the arrow or blinking cursor to act strange. If this happens, just remove the INIT from the system folder and restart. This should solve any problems if they occur.

A trackball requires some adjustment. I was surprised to discover new muscles in my hand; muscles that became tired when I first started using MacTrac. However, it is a quick adjustment. Now, rather than trying to move the trackball like a mouse, I find myself wanting the mouse to work like MacTrac. (MicroSpeed, Inc., 44000 Old Springs Blvd., Fremont, CA 94538. 415/490-1403)

BOOK REVIEW

DR. FILE FINDER'S GUIDE TO SHAREWARE

Written By: Mike Callahan and Nick Anis
Published By: Osborne McGraw-Hill
List Price: $39.95; includes diskette with shareware programs plus coupon for two additional free diskettes
Reviewed By: Dan Baumbach



Shareware programs are programs that you can freely give copies of to anyone without violating the copyright. If the person using the program finds it useful, he or she is required to register the program with the author and pay a registration fee. This fee is usually significantly less than comparable "commercially distributed" software.

There are hundreds of thousands of shareware programs available on computer bulletin boards, from disk libraries and user groups, but very little is written about these programs in the computer press. The only way to find out about this gold mine of software has been word of mouth or disk vendor's catalogs. Well, now there's *Dr. File Finder's Guide to Shareware*, a new book that tells you about available shareware programs, what's good and where to find them.

A good subtitle for this book would be "Everything You Wanted to Know About Shareware But Were Afraid to Ask." Co-author Mike Callahan wanted to make this book as complete and up-to-date as possible. It's taken him one thousand pages to do it, but he has done a fabulous job. Callahan's life is devoted to shareware and he tries very hard to give the reader a thorough background in it. He includes

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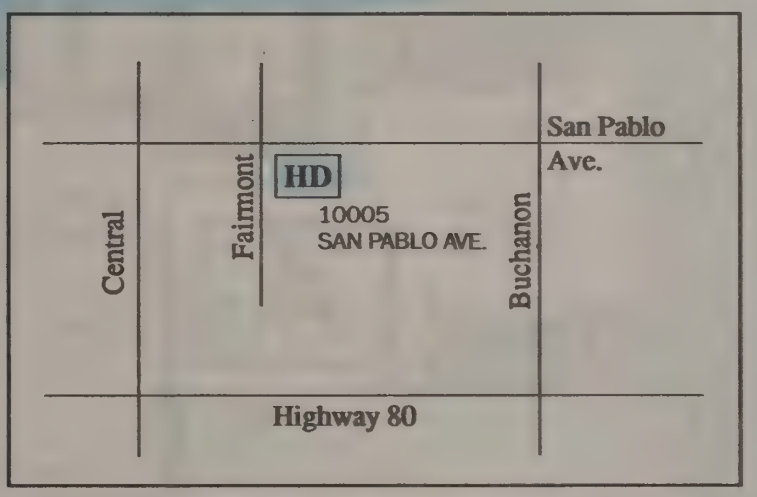

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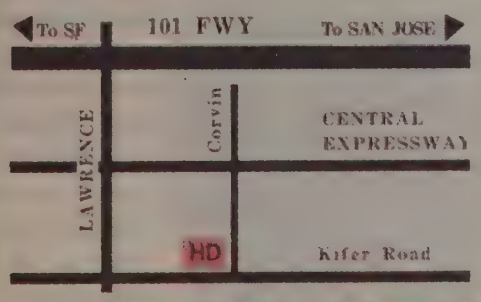

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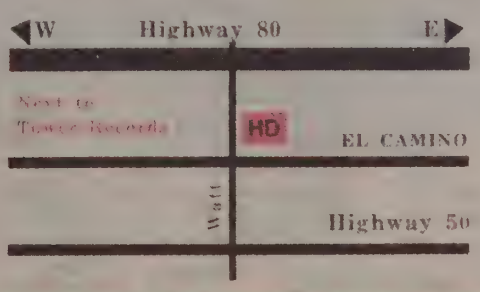

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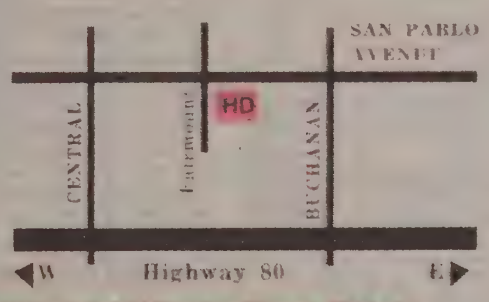

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a diskette with some of his favorite shareware programs so the reader can sample shareware firsthand. A coupon at the back of the book offers two additional diskettes at no charge.

The authors define what shareware is and is not. They let you know how to get copies of shareware programs, and provide extensive details on how to access bulletin boards They go through the different categories of programs, offering descriptions and recommendations for the better programs. And finally in the appendix, "The Doctor" gives you the phone numbers of his favorite bulletin boards.

Dr. File Finder's Guide to Shareware does a great service to an often overlooked area of software. With the extensive descriptions of available shareware programs, anyone looking for good-quality, inexpensive software will now be able to know what programs to look for and where to find them; and since the programs are shareware, users won't have to pay for the software until they use it and see if it suits their needs first.

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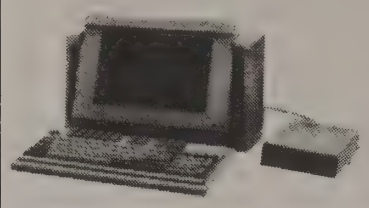

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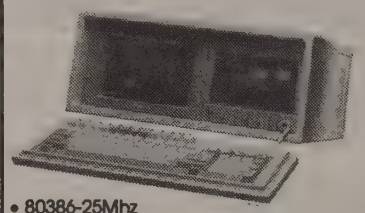

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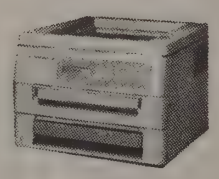

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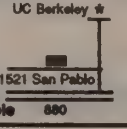

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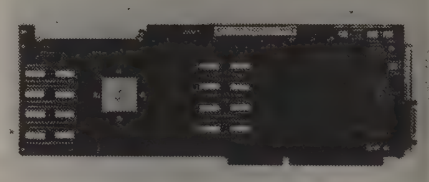

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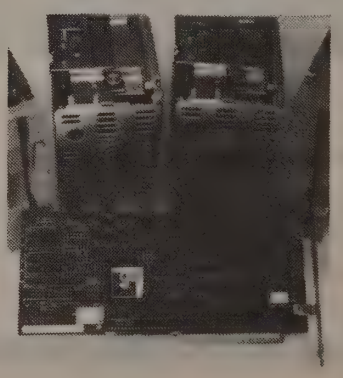

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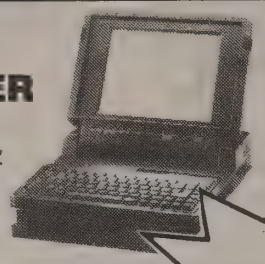

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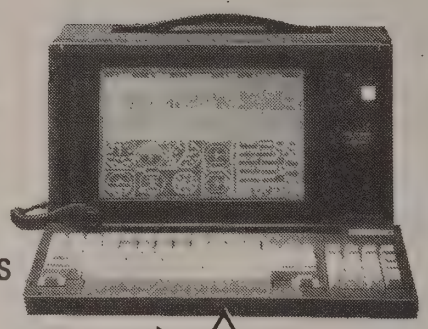

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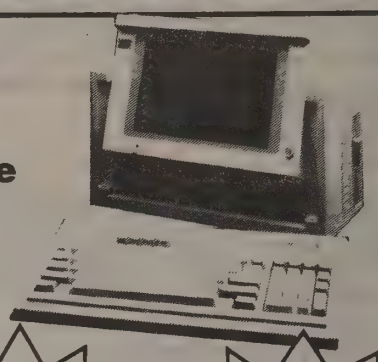

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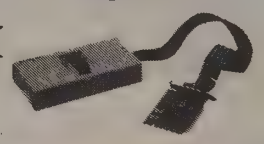

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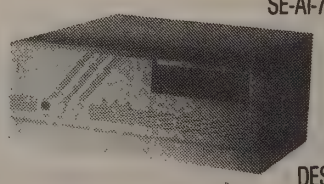

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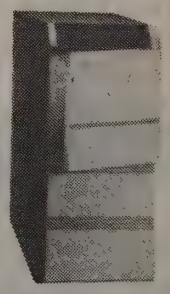

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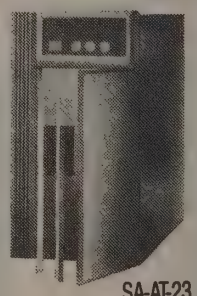

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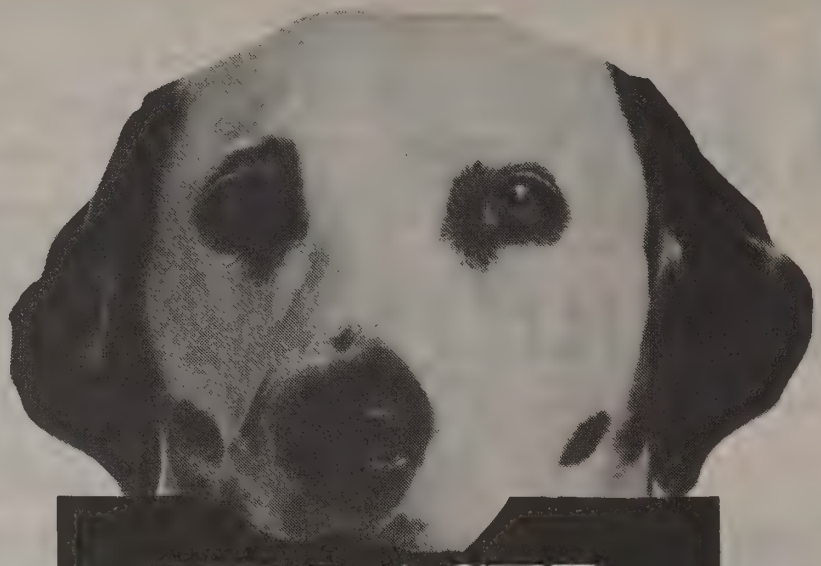

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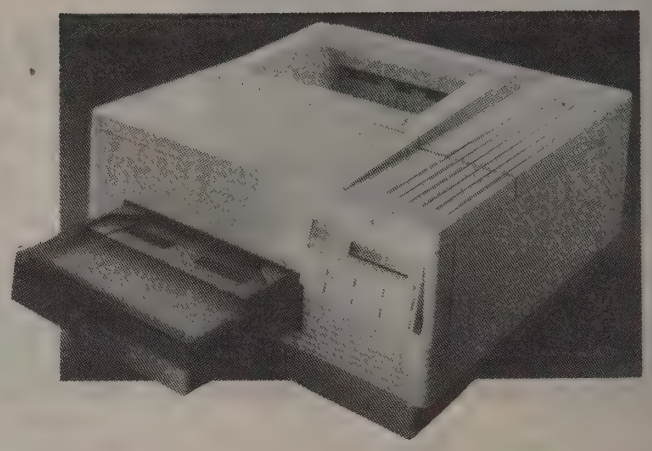

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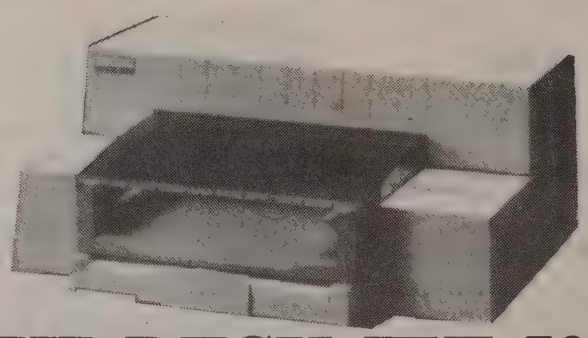

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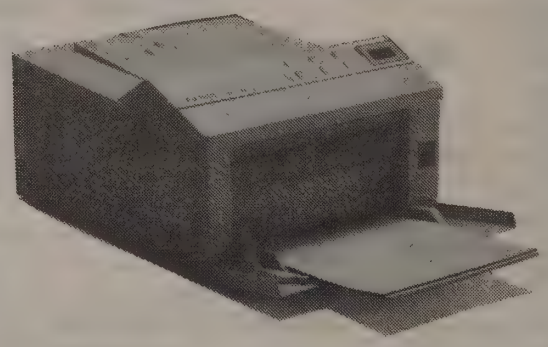

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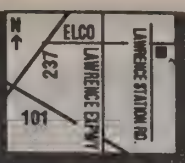

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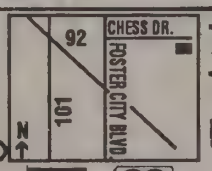

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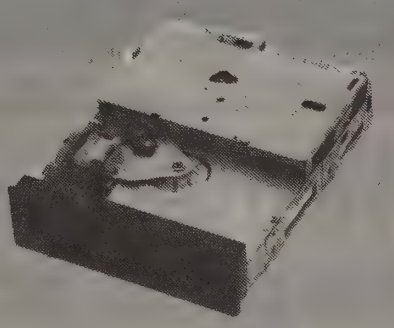

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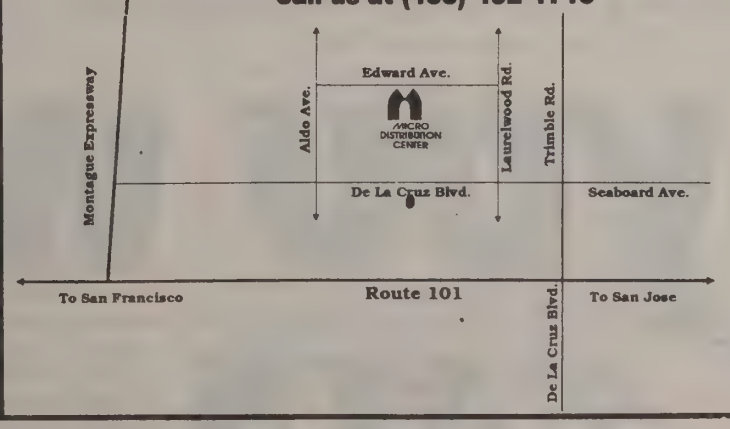

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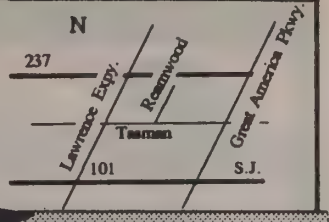

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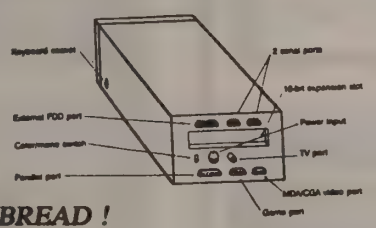

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High-price systems may help establish Apple as a player in scientific and businessperson-on-the-go markets, but those could easily be markets with few buyers in the near future.

nies have sprung up in the countries in which Apple is strong, such as Japan and France. If Claris sets up local marketing companies in these countries and modifies its software and manuals to meet the local standards, Apple stands to weather the storm better than if its software is primarily American.

Through numerous press leaks, it is well known that Apple is working on a small portable and an expensive 68040-based system for release later this year. It may behoove Apple to look lower in the market and see what it can do for the hundreds of thousands of new Classic buyers this year. Even though they are new to the market, these people may be Apple's best bet in a recession, since they're more reliant on Apple than the IIci user who doesn't really need a new system if money is tight. High-price systems may help establish Apple as a player in scientific and businessperson-on-the-go markets, but those could easily be markets with few buyers in the near future. ■

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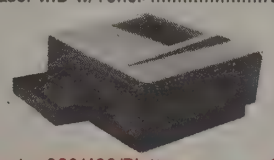

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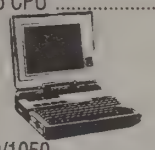

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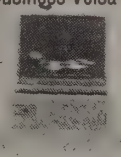

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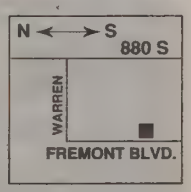

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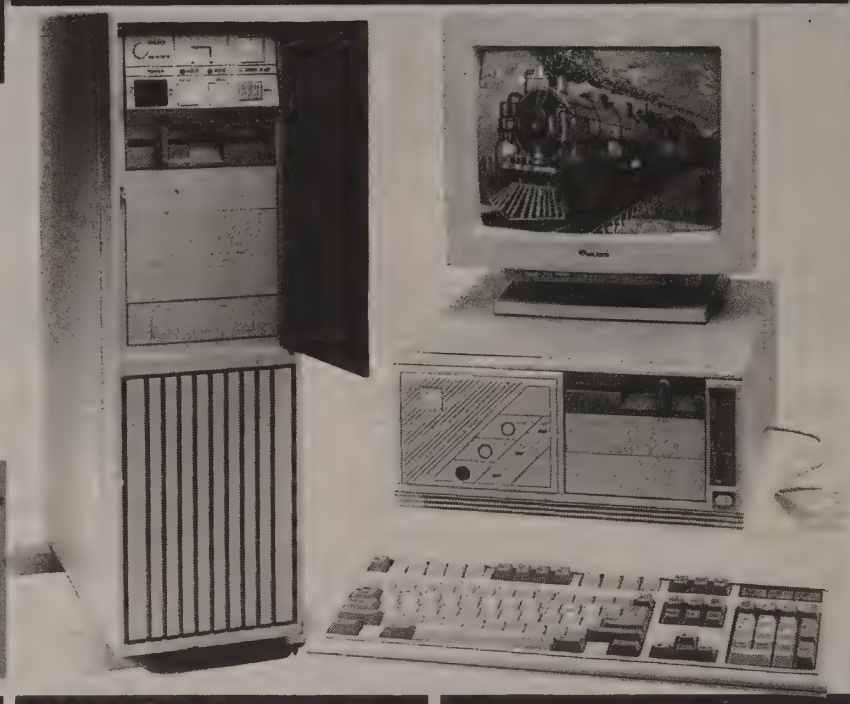

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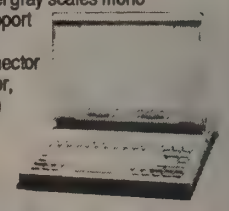
- One 3.5" FDD & one 40MB HDD
- 1 Serial and 1 parallel port
- LCD display w/16 level gray scales mono w/VGA/EGA/CGA support
- Internal modem slot
- Ext. video (VGA) connector
- 3-Way: AC/car adaptor, battery pack (optional)
- 85/86 keys, multi-language ALPS tactile keyboard



MICRO-L 486-25 AT Cache $2,245

- Intel 80486-25MHz CPU, Lndmk: 114.10 MHz
- CMOS Set-up, MIPS: 11.104
- CPU Built-in 1st level 8KB Cache memory with 2nd level 256KB Cache memory
- 4MB RAM expandable to 16MB on-board
- Supports external Weitek 4167
- Eight 16-bit slots
- AMI/Award 486 BIOS supports Shadow RAM
- 1.2MB and 1.44MB Floppy drives (TEAC)
- 2 serial, 1 parallel ports
- 1:1 interleave ESDI controller with 32k Cache or IDE
- Keytronics (USA) or Mytek (click-type)101 keyboard
- Tower case w//7 bay drive/digital display/230W P/S
- **33MHz (Lndmk: 149.60, MIPS: 14.597) add $365**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440	14" Multiscan 1024 x 768** Sony 1304
Basic System	2,245	2,685	2,875	3,125
WITH HARD DRIVE				
80MB - IDE	2,635	3,075	3,265	3,515
100MB - IDE	2,670	3,110	3,300	3,550
200MB, 15ms - IDE	2,985	3,425	3,615	3,865
*338MB, 16ms - ESDI	3,655	4,095	4,285	4,535

*Master Drive **ORCHID ProDesigner II - 1MB

MICRO-L 386-33/Cache $1,450

- Intel 80386-33MHz CPU, Lndmk: 58.7MHz/, MIPS: 7.99
- 4MB RAM exp. to 16MB on-board • SIS™ Chipset
- 80387 Weitek WTL 3167 co-processor socket
- AMI BIOS • 64k Cache expandable to 128k Cache
- True OS/2, XENIX, MS DOS, & Novell compatible
- 8 expansion slots (1-32, 8-16 bit)
- 1:1 interleave ESDI controller with 32k Cache or IDE
- 1.2 MB and 1.44MB FDs (Teac)
- 2 serial, 1 parallel, 1 game port
- Keytronics (USA) or Mytek (click-type) 101 keyboard
- Tower case w/7 bays/digital display w/230W P/S
- MS DOS 3.3 or 4.01 included

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440	HiRes VGA** 1024 x 768 Sony 1304
Basic System -	1,450	1,890	2,080	2,330
WITH HARD DRIVE				
80MB - IDE	1,840	2,280	2,450	2,720
100MB - IDE	1,875	2,315	2,485	2,755
200MB, 15ms - IDE	2,190	2,615	2,800	3,070
*338MB, 16ms - ESDI	2,860	3,300	3,470	3,740

*Master Drive **ORCHID ProDesigner II - 1MB

MICRO-L 386-25 $1,175

w/o HDD/Video/Monitor

- 80386-25MHz CPU, Lndmk: 30.0MHz
- True OS/2, XENIX, MS DOS, & Novell compatible
- 4MB RAM expandable to 8MB
- 80387 co-processor socket
- 1.2 MB & 1.44MB FDs (Teac)
- 1:1 interleave controller or IDE
- AMI BIOS, NEAT™ Chipset
- 8 expansion slots/2 serial, 1 parallel, 1 game port
- Keytronics 101keyboard (USA) or Mytek (click-type)
- 6-drive Baby AT case with security lock, LED indicators
- 200W power supply/Tower Case add $85
- MS DOS 3.3 or 4.01 included

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	12" Mono 720 x 350	14" VGA 640 x 480 ReliSys	14" Multiscan 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440
Basic System -	1,270	1,545	1,615	1,805
WITH HARD DRIVE				
40MB - IDE	1,475	1,750	1,820	2,010
80MB - IDE	1,660	1,935	2,005	2,195
100MB - IDE	1,695	1,970	2,040	2,230
200MB, 15ms - IDE	2,010	2,285	2,355	2,545

MICRO-L 386-SX $825

w/o HDD/Video/Monitor

- 80386/SX-16 CPU runs 16MHz
- 80387 co-processor socket
- 2MB RAM expandable to 8MB
- 1.2 MB & 1.44 MB floppy drive (Teac)
- True OS/2, XENIX, MS DOS, and Novell compatible
- AMI BIOS, NEAT™ Chipset
- 1:1 interleave HD/FD IDE controller
- 8 expansion slots/2 serial, 1 parallel ports
- Keytronics (USA) or Mytek (click-type)101 keyboard
- 6-drive Deluxe baby-AT case with 200W Power Supply
- MS DOS 3.3 or 4.01 included
- **386/SX-20MHz add $90**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	12" Mono 720 x 350	14" VGA 640 x 480 ReliSys	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440
Basic System -	925	1,195	1,265	1,455
WITH HARD DRIVE				
40MB - IDE	1,130	1,400	1,470	1,660
80MB - IDE	1,315	1,585	1,655	1,845
100MB - IDE	1,350	1,620	1,690	1,880
200MB, 15ms - IDE	1,665	1,935	2,005	2,195

MICRO-L 286-12 $385

w/o HDD/Video/Monitor

- 80286-12.5MHz CPU
- True OS/2, XENIX, MS DOS, and Novell compatible
- 80287 co-processor socket
- 1MB RAM expandable to 4MB
- 1.2 MB floppy drive (Teac)
- 2 HD/2 FD IDE controller
- 2 serial, 1 parallel, 1 game port
- 101 Enhanced keyboard
- 6-drive Deluxe baby-AT case with 200W power supply
- **16MHz add $45**
- **20MHz add $85**
- **25MHz add $125**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	12" Flat Mono 720 x 350	14" VGA 640 x 480 ReliSys	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440
Basic System -	480	740	825	1,015
WITH HARD DRIVE				
40MB - IDE	680	950	1,030	1,220
80MB - IDE	870	1,130	1,215	1,405
100MB - IDE	905	1,165	1,250	1,440
200MB, 15ms - IDE	1,220	1,480	1,565	1,755

MOTHERBOARDS

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MONITORS

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- Relisys Super Multiscan RE-1520 ... $580
- Relisys VGA Gry-Sc RE-9503 ... $125
- Seiko VGA 1024X768 CM-1440 ... $490
- Seiko VGA 1024x768 CM-1458 ... $595
- Sony VGA 1024x768 1304 ... $650
- Nanao 16" VGA 1024x768 9070-D ... $1030
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- Sigma Design LaserView 19" ... $1650
- Genoa VGA Card 6300 (256K) ... $105
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- SpeedStar VGA 1MB ... $230

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- TEAC 1.2/1.44 MB FD ... $65
- Logitech C-9 Serial/Bus mouse ... $65/77
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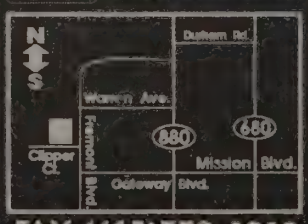

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Continued from page 26

ing the property interests of some of us without violating the freedom of speech of the rest of us. This is clearly a matter of protecting civil liberties, and thus familiar to those who take an interest in upholding the Bill of Rights, but it is also more than that.

These embryonic media of electronic mail, computer bulletin boards and conferencing systems, provide open forums of communication. They are a healthy antidote to the corrosive effects of the power of large, centralized institutions, private and public, and to the numbness induced by one-way, least-common-denominator mass media.

In the physical world, our sense of community withers. Urban centers as places to live are being abandoned by all who can afford to leave. In the global suburbs in which more and more of us live, one's horizon is limited to the immediate family. Even close neighbors are often anonymous.

The government should not be able to seize a bulletin board any more easily than it can seize a printing press. We must find ways for law enforcement to do its job in protecting the property interests of some of us without violating the freedom of speech of the rest of us.

In the realities that can be created within digital media there are opportunities for the formation of virtual communities—voluntary groups who come together not on the basis of geographical proximity but through a common interest. Computer and telecommunications systems represent an enabling technology for the formation of community, but only if we make it so. I believe it is urgent, as a matter of national policy, that we encourage and further stimulate the social experiments and developing infrastructure that are taking place on the Net every day. The ultimate mission of the EFF is to help articulate this vision and play a constructive role in the working out of the new legal and social norms which we are faced with developing.

As John Barlow and I meditated together last June on the broader implications of the initial events—a meditation that catalyzed the formation of the EFF—we could see that what was at stake was not merely seeing justice be served in the case of a few individuals, nor simply the preservation of the civil liberties of all of us, although these goals are vitally important.

The larger issue is how our society will come to terms with the onrush of transformative technology. If we take the right steps now—and EFF is working to take those steps—new and increasing access to information technology will enhance rather than inhibit the positive growth and development of individuals, of communities, and of society as a whole. ■

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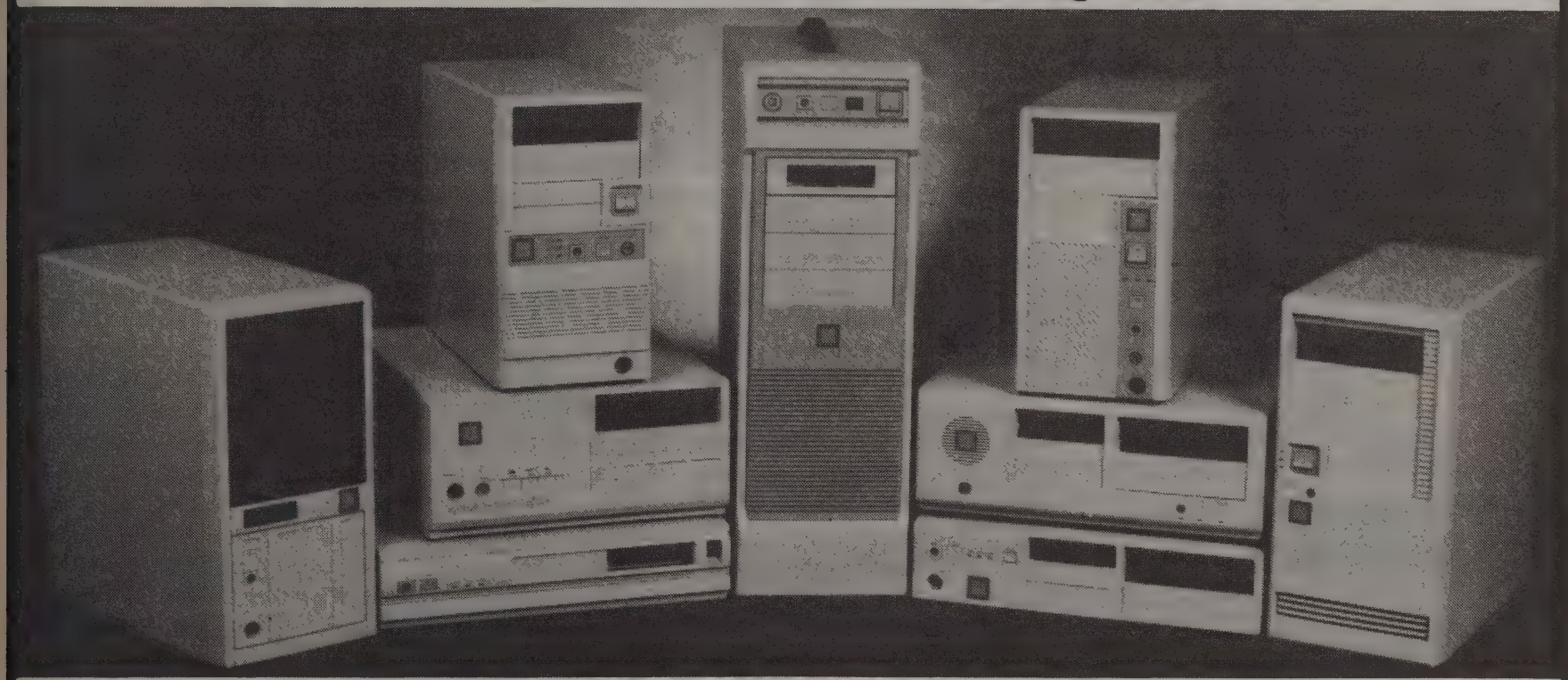
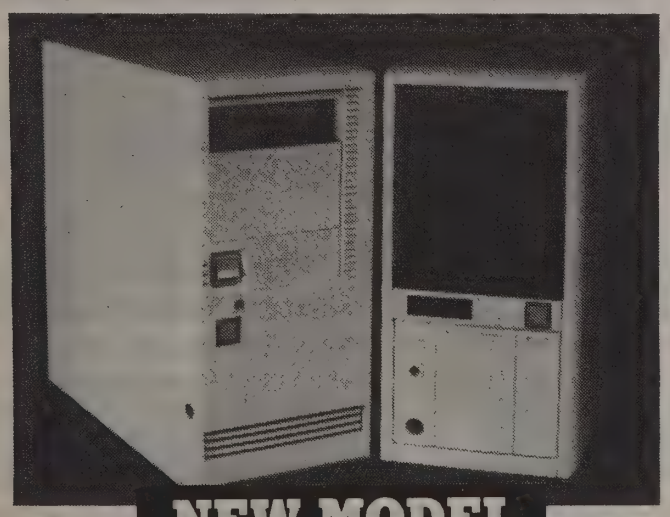


MODEL: 901 & 902
SPECIFICATIONS:

- Full size or baby size Mother Board.
- Three 5¼" Drive Bay.
- Two 3½" Drive Bay.
- One 3½" Hard Disk Drive.
- Digital LCD.
- 1.44mm Metal Sheet.
- Dimensions: 7⅞"x16"x15¾"



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CREATIVE TOOLS

Titling Tales

New Tool For Video Professionals

BY MATTHEW LEEDS

AMIGA

Amiga users are accustomed to using software created by developers with their own ideas on user interface. Unlike the Mac, the Amiga does not have a set standard for things like file requesters, naming conventions for functions, or even what each mouse button should do. Witness Deluxe Paint's violation of the concept that the right mouse button only activates menus.

This eclectic approach to product design is complicated by the fact that the Amiga's strongest market so far has been video. In some areas of the video marketplace, the Amiga is replacing existing hardware with some level of standardized user interface. A prime example of this is in the area of character generation.

Take a look at a commercial character generator. You won't find a mouse. The keyboard will have dedicated function keys with labels that describe their functions. You won't find drop-down menus. For a video professional used to a character generator, using an Amiga with many of the titling programs requires a steep learning curve.

BROADCAST TITLER 2

Innovision Technology made a design decision when it created Broadcast Titler: it decided to emulate the environment video professionals are used to rather than force them to learn how to use a computer. The latest version, Broadcast Titler 2 (BT2), expands on this concept, and adds a remarkable amount of additional functionality.

One interesting side effect of this decision is that Amiga users who opt to use this program will find themselves in unfamiliar territory. BT2 presents a menu bar at the bottom of the screen rather than at the top, similar to DigiPaint. Pressing the **Escape** key toggles the menu bar on and off, leaving only the text edit mode screen visible. Buttons in the menu bar are used to select function modes which bring up additional screens and buttons. It's a little different, but easy to adapt to.

The extra effort to learn BT2 is well worth it, as the results are exquisite. Fonts are rendered with excellent anti-aliasing, eliminating any appearance of jagged edges. Fonts can have character attributes that include outlines, highlights, underlines, solid and cast shadows, with up to fifty different fonts used in a presentation. Sixteen fonts are included, and standard Amiga fonts can be converted for use with BT2 (see below). Each screen may contain up to 320 colors in high res mode. Full overscan support (736x480) eliminates any borders, and screen scrolling is perfectly smooth.

You can import IFF pictures for use as backgrounds, and IFF brushes can be used as fill patterns for patterned text. In addition, almost one hundred page transition effects are included with the package.

For Amiga 3000 owners, an optional upgrade provides support for the Super High Resolution mode the ECS Denise chip offers. This mode doubles the horizontal resolution of the display but limits the displayable colors to four colors per text line and sixty-four per screen.

BT2 includes a font converter that will let you use standard Amiga fonts in the program. These converted fonts will not, however, have the anti-aliasing provided by the fonts supplied with BT2. An optional font enhancer will both convert Amiga fonts and add the anti-aliasing. In addition, the converted fonts will then use less memory in BT2. Innovision Technology also supplies fonts in both Amiga and BT2 formats.

The manual supplied with BT2 is excellent. It walks you step by step through installation and tutorials, with useful reference sections and some very interesting dissertations on color theory and practical use.

BT2 has some well thought-out features. You can access any page in memory directly, control the letter spacing (kerning) of text on a line at the character level, cut and paste page transitions, trigger a playback sequence via a GPI (General Purpose Interface, a video industry standard) trigger connected to mouse port two, and manually control the playback of pages via a status bar visible only on the RGB monitor (and not on the NTSC output).

BT2 requires at least 512K of true FAST RAM and a total of 1.5Mb RAM. This has implications for some A500 owners. Most memory placed in the memory expansion slot under the A500 is not true FAST RAM. BT2 runs with either ADOS 1.3 or 2.0, and works fine on the A3000 as long as it has at least 3Mb total RAM (this is due to Kickstart loading into RAM rather than running from ROM; when Kickstart 2.0 is provided in ROM on the A3000 this will no longer be an issue).

Broadcast Titler 2 provides the best looking results of any Amiga titler program I've used so far. The anti-aliasing technology in BT2 is excellent. Most users will eventually decide to buy the optional anti-aliasing font converter, and so you should factor this additional cost into your budget.

AMIGA AT MACWORLD

I recently attended the Macworld Expo, a trade show in San Francisco dedicated to the Macintosh computer. It's the largest Mac show in the US.

Among all the vendors showing Mac products was one very crowded booth staffed by a company from Kansas. They were showing an unusual video peripheral: it had no direct Mac connection (other than accepting and outputting video signals), didn't actually require a Mac, and was controlled via a keyboard and a two button mouse.

This booth was constantly mobbed by excited Mac users, elbowing their way closer to see this amazing video peripheral from a company they'd never heard of before.

The peripheral, of course, was the Amiga 2000 with a Video Toaster, and the company was NewTek. The faceplate of the A2000 was covered with a sticker labeling the box as a "Video Toaster." No mention was made during the demos of the dreaded "A" word. This was infiltration with a vengeance.

I stood next to two people watching the demo. They were amazed by what they were seeing, and were discussing the immediate purchase of a "Video Toaster" for use in their business. I couldn't resist filling them in on the joke, of course, and explained that what they were seeing was an Amiga computer equipped with a NewTek video board. They looked at each other, turned, and walked away from the booth. ■

RESOURCES:

InnoVision Technology
1933 Davis St.
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94577

Copyright © 1991. All rights reserved. *Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.*

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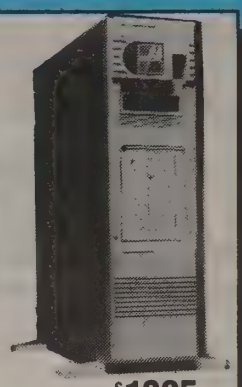

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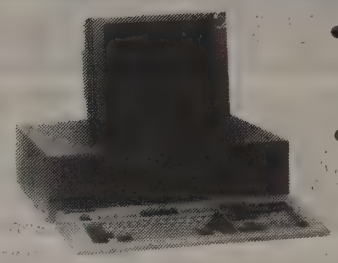

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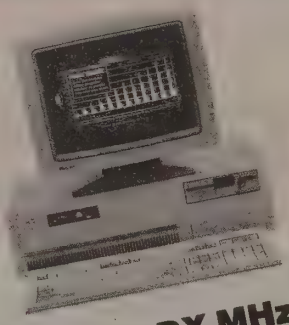

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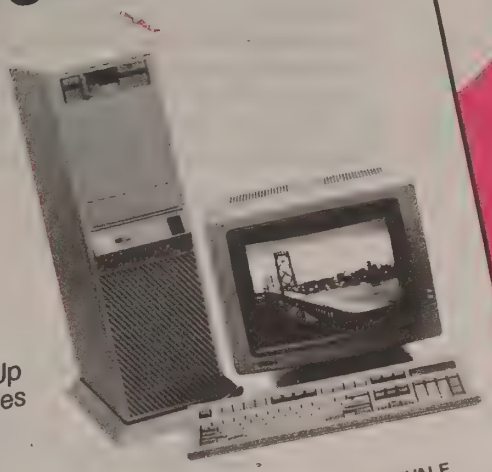

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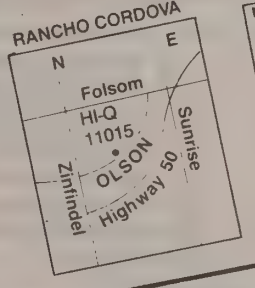

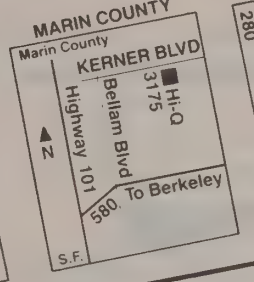

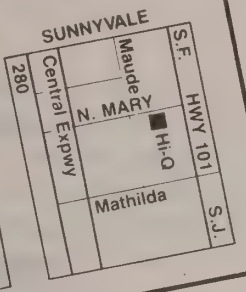

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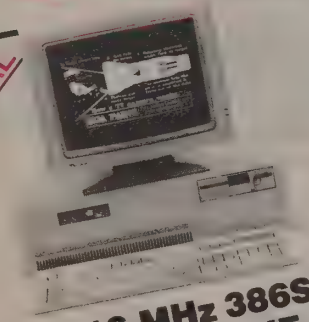

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Landmark = 22.6 SI = 18.7

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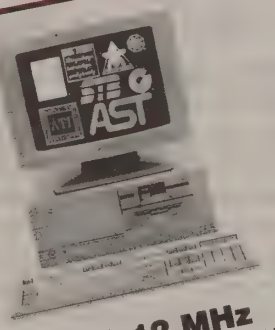

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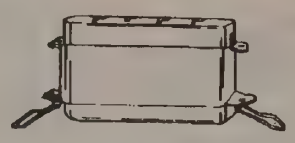
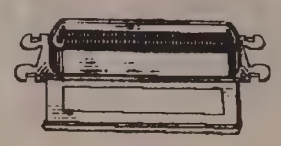


(C)
Feed-thru SCSI Terminator
$7.95



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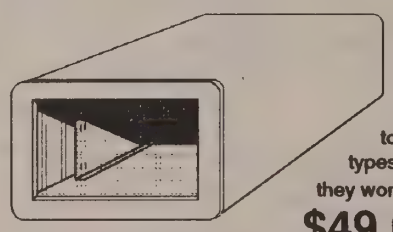

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Dr. Halo III Paint Program by IMSI can be used as a page composition (mini-Desktop Publisher!) and graphics presentation tool. Merges text and graphics, features over twenty typefaces with attributes. User controlled color management, "lasso" selection, aspect ratio correction for WYSIWYG prinitng, and X-Y coordinate cursor display. Requires DOS 2.1 or above. All for **$20.00!**

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Atari's New Desktop

Even If You Have An Old Machine, You Can Enjoy An Updated Interface

BY DAVID HAWKINS

Last month I mentioned that the TT and the new Mega STE have an improved desktop—the graphic interface you use to get around on the Atari. The old desktop had not seen much change in four years, so the new one is very impressive. Of course, you have to have a TT or a Mega STE to take advantage of it.

NEODESK

Fortunately, a couple of programs can replace the desktop on an existing Atari ST 520 or 1040. One of these is NeoDesk, available from Gribnif Software, P.O. Box 350, Hadley, MA 01035, (413)584-7887. It has a list price of $69.95 and is a very good replacement for the old desktop. The present version is 3.0.

INSTALLATION

When you use NeoDesk for the first time it replaces the existing desktop. All operations, like opening disks and starting programs, are now done through NeoDesk. It's highly recommended that you read the manual carefully about how you want to set up and customize NeoDesk, since its options and powerful features offer a lot of choices.

WINDOWS

Normally, when you open a window in the old desktop, it shows some of the files and/or programs, but some of them are off to the right side of the window and you have to scroll to the side to see them. NeoDesk wraps the display of files so that you only have to scroll up and down to find all the files in that folder.

You can also toggle each window between a graphic representation of the file or a text description. In the old desktop, your desktop choices carried over into all windows, but NeoDesk allows you to display some as text and others as icons. You can also click on one part of the window to select every file in the folder, which can be a handy feature.

You can also split a window, which is helpful if you're trying to organize a lot of files or folders in one window.

ICONS

Ever used a Macintosh? You might have noticed that most of the programs have distinctive icons. Once you know the icon for Microsoft Word, it's easy to find when you open a window.

On the old Atari desktop the program icons all look the same, but NeoDesk allows you to have specialized icons for programs, files, and folders. It includes an icon editor, and you can make the icons different colors if you'd like.

FEATURES, FEATURES, FEATURES

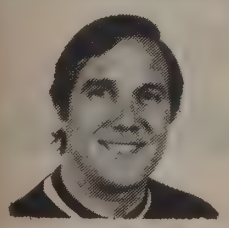
That's only a small part of what NeoDesk does. You can write notes to yourself right on the desktop. The program allows you to have a background picture on the screen. You can move files and folders to the desktop. You can recover files from the trashcan. You can print a file by moving its icon to the printer icon. Well, there's more, but you get the idea.

OTHER NEWS

Spectre GCR is now up to version 3.0—and 3.1 is being tested. The Spectre is the program that allows you to plug in a cartridge and run Macintosh programs from Mac disks. The newer version is faster, recovers from crashes better, and provides better sound and improved keyboard emulation. Spectre is available from Gadgets by Small, Inc., 40 W. Littleton Blvd. #210-211, Littleton, CO 80120, (303)791-6098.

Wordflair II is out. Added features include a spelling checker and a thesaurus. The graphics handling is faster, and the interface has been improved. The database functions are now more powerful. For more information on Wordflair, contact Goldleaf Publishing, 700 Larkspur Landing Circle, Suite 199, Larkspur, CA 94939, (415)381-7717. ■

With Neodesk, you can also toggle each window between a graphic representation of the file or a text description. It allows you to display some windows as text and others as icons. You can also click on one part of the window to select every file in the folder, which can be a handy feature.



Copyright © 1991 by David Hawkins. All rights reserved. *David Hawkins is the host of the Atari conference on The WELL (415/332-6106); send email to dhawk. He has one of the first Atari ST 1040s sold in San Francisco. Both monitors, an Okimate 20 color printer, and disks are all over the room.*

Highlights From The Macworld Expo

Neat Products, Trade Show Skulduggery, And Wizardly Predictions

BY DAVID MORGENSTERN

The San Francisco Macworld Exposition is history, packed in mothballs, or perhaps lost in the mail. My ailing feet have yet to recover from the marathon of exhibits, demonstrations, and parties.

This was one of the best Expos of the past couple of years. Interesting software, games, and multimedia-related products have elbowed their way onto the show floor, between the spreadsheet-networking-database crowd. Only the most jaded of Macintosh maniacs left the show with wallets intact.

The booths in the Moscone Center keep growing like escapees from Grade-B monster movies. If the booth is on steroids, the product must be good, right? Brooks Hall, across town, was populated by small interesting startup companies in minimalist booths. In two years, the new additions to the Center should be complete, and the whole show will be in one immense Macintosh zone.

BMUG

The BMUG booth was the hottest place in the show—no kidding! The crowds were thick around the booth, checking out our new products, and the latest edition of the BMUG Newsletter. The crush was so great that a woman fainted while talking to Steve Costa, BMUG Director—he's a popular guy, but swooning?

Our publication department worked overtime to finish two new books for the Expo. *Zen and the Art of Resource Editing: The BMUG Guide to Resource Editing,* and *HyperTalk 2.0.*

The ResEdit book is a collection of articles on the program's new features in plain language, edited by BMUG's Derrick Schneider. ResEdit 2.1, a collection of color icons, and programs that let you display them, are on a floppy that comes with the book.

HyperTalk 2.0 is authored by Ted Jones, the co-author of the *HyperCard Bible.* It covers all the new features in HyperTalk 2.0 in an easy-to-read format, with lots of examples. Included is a disk of interesting stacks from the BMUG HyperCard library. Each book and disk combo is $15.

Copyright © 1991 by David Morgenstern. All rights reserved worldwide. David Morgenstern is a Bay Area "MacNurturer" and BMUG member. David is DMORGENSTERN on MacNET, 72030, 1607 on CompuServe, and himself at (415)549-BMUG.

System 7.0 was hot on the lips of the seventy thousand faithful pilgrims attending the Expo. I caught Paul Husbeth, Apple's System 7.0 product manager, climbing out of a bus that shuttled between the two downtown show sites. He was traveling incognito, and had asked his seat-mate about the upcoming system software. "He was right on the mark," Paul said, with only a few lapses in the more arcane details.

Paul said that developers working in Mac and Windows environments claim that the first beta of System 7.0 (7.0b1) is more stable than the final release of Microsoft Windows 3.0. Or maybe they just want to butter up the Apple bigwigs.

Life pushed its way onto the video-board displays in the SuperMac and Radius booths on Saturday. The mob thinned a fraction because of a 49er playoff contest. Dozens of hybrid Macintosh/Sports fans clustered around monitors filled with spreadsheets, graphs, and the ball game. Disturbing the technological-recreational entertainment were the news flashes from the congressional vote on the war with Iraq that kept popping up on the desktop. Talk about virtual reality!

EXPOSTFACTOID

Some demo weary know-it-alls thought the Expo dull. They couldn't have been looking very hard—I found plenty of goodies. Here are just a few:

•The best hardware hack of the show was the TokaMac upgrade board for the Mac LC by Fusion Data Systems. It's a 68040 accelerator, running at 15 MIPs, that plugs into the Processor Direct slot. This $3,000 upgrade makes the LC faster than the Mac IIfx.

A number of companies had hoped to come out with an LC-based

It seemed too good to be true—a $1600 video board with a multi-input production switcher, lots of wild digital effects, 3D animation, character generation, frame grabbing, and NTSC output.

It was too good to be true. It runs on the Amiga!

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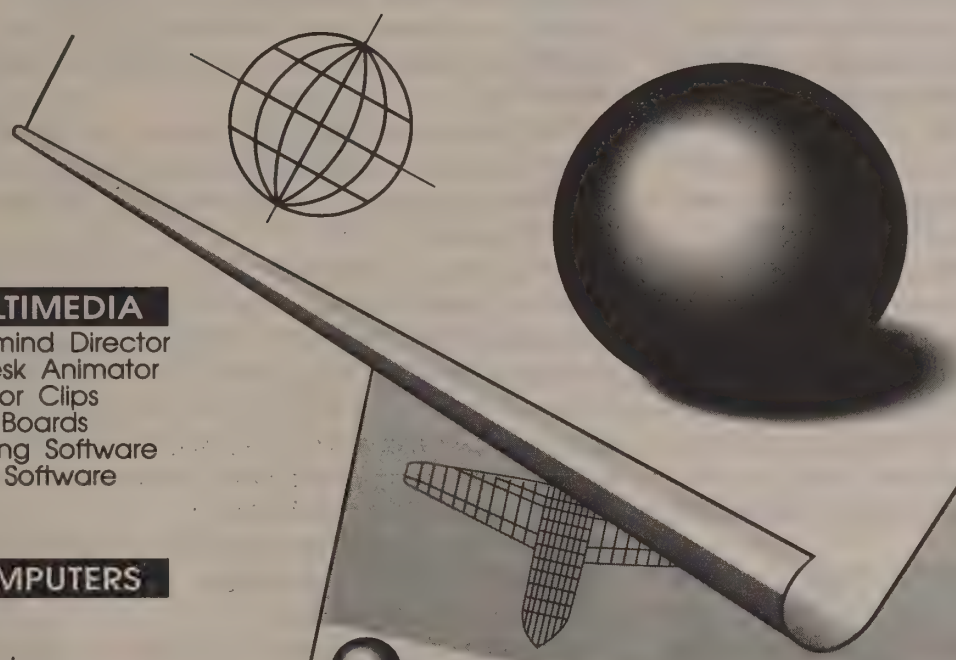

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'040 upgrade, but were caught without a product. The project engineers at DayStar left town to start their own upgrade company. The marketing representatives at Total Systems, with a line of 68030 boards, claimed that the TokaMac was an "irresponsible" product. They claimed that the '040 runs too hot for the under-powered LC power supply. Fusion engineers replied that the Direct slot is set for four watts, and their board comes in around 3.82 when the 68040 is running in the small buffer mode. They also said that the Apple Mac LC product manager had blessed the card.

•It seemed too good to be true—a $1600 video board with a multi-input production switcher, lots of wild digital effects, 3D animation, character generation, frame grabbing, and NTSC output.

It *was* too good to be true. It runs on the Amiga!

NewTek, Inc. was showing the Video Toaster system, a board that uses the built-in video capabilities of the Amiga to do cool video. They were packaging the Amiga, the Toaster, and a cable to bring in Mac graphics for around $4,000. A good price for all the features, although there's no timecode. NewTek is thinking of ditching the Amiga and putting everything into its own box. Marc Canter, Mr. MultiMedia, claims that NewTek spent millions developing the board, and are "giving it away."

•Compression was a hot topic at the Sigma Designs booth. They showed a $229 compression card called the DoubleUp. The software front end that controls the specially designed 40MHz processor is a version of the DiskDoubler utility. It automatically decompresses files when they're opened, and squeezes them back when they're closed. Aladdin, the maker of StuffIt Deluxe, was showing a prototype of a fancy board, called the Cheetah. It may be better technology, but it's still in development, and the inexpensive DoubleUp card is here now.

•Health and safety were addressed by a number of vendors. The high-priced spread of the ergonomic aids was the $250 ErgoArm device at the MacStation booth. It's a fully articulate arm-support, made of plastic and metal, that clamps on the desk in front of your computer.

Elf Armor by Fairfield Engineering seems to really reduce ELF (Extremely Low Frequency) magnetic emissions in compact Macs. These emissions may cause cell mutation and cancer in computer users. The $80 device is a metal tube that fits around the rear of the video monitor. The company will be coming out with a product for Apple 13" color monitors.

•The best game at the Expo was the latest release by Mike Saenz, the creator of MacPlayMate and Virtual Valerie. His company, Reactor Software, was showing Spaceship Warlock, a CD-ROM-based interactive game/movie. His artwork is fantastic, with alien pirates, spaceships, great 8-bit color, and lots of action. It even has an original musical score! I don't know if I want to spend $100 on a game, but this one will be a good second disk to buy for your new CD-ROM drive. After the BMUG PD-ROM, of course.

BMUG Calendar

March 7 RasterOps, video products; Asante, Ethernet boards

March 14 Animatrix, Interactive Animation; GCC Technologies, printers and hard drives

March 21 Nova, Handbook of Business Letters; Dantz, Retrospect Remote

March 27 **BMUG West meeting, Exploratorium, San Francisco:** Slide Factory, imaging services; Arés, FontMonger

March 28 Lifetree Software, Correct Grammar 2.0; Odesta, Double Helix

April 4 New Latitudes, MasterPlan (project planning), Specular, Infini-D (3D modeling)

ARE WE HAVING FUN YET?

The front line of marketing trench warfare was dug deep into the carpet of the Macworld Expo. It was authentic dirty tricks time, with no referees.

•Quark, the developer of XPress, a high-end desktop publishing program, produced a slick gray and yellow brochure. It compared the features of XPress 3.0 to competitors, Aldus PageMaker, and Ventura Publisher.

The PageMaker representatives "borrowed" a copy of the handout the evening before the show opened. Working into the night, they created a sheet in the identical style, titled *Errors and Omissions 3.0*. It chronicled a long list of supposedly missing features of XPress, including twenty-seven lengthy notes in microscopic-sized text. It wasn't enough of a good joke to distribute it in the Aldus booth, so they stuffed the gag sheet into the originals stacked at the Quark booth. The old insert-and-run attack.

Through clenched teeth and fiXed smile, the Quark managers eXPressed their dismay, "it was slightly underhanded." Just wait until the neXt eXPo, PageMaker!

•The Jasmine/iDs booth featured a live chimp. Attendees had their pictures taken with ape on one arm, and a hard disk on the other. Jasmine was one of the major hard drive players in the Mac market from 1986 to 1989. Its Expo parties were phenomenal affairs, with endless quantities of food, booze, rock 'n roll, and T-shirts. After a couple of marginal products, lawsuits, and managerial infighting, the company went into Chapter 11 bankruptcy.

Chess SA, a French holding company, bought Jasmine last year. It claims that it will reimburse the thousands of creditors, most of them users, that bought lousy drives as the firm went under, over the next five years. It's selling a line of small hard drives powered from the external floppy port, known as the Wip drive.

LATE PREDICTIONS

It's always easier to look ahead at the upcoming year with a little distance. It's even easier after the San Francisco Expo, since that's the major migration pattern for Macintosh developers. They fly into town, rent hospitality suites at the high-rise hotels, and try to lure press or venture capitalists into their nests.

Here are the few predictions that I could pressure hangers-on in the BMUG office into giving. They were burned badly last year, especially on their System 7.0 predictions. They wouldn't come outside and play!

Bernard Aboba, BMUG's Telecommunication's Guru and ex-Board member: Some predictions I made last year didn't come true, so I think I'll make them again. If they don't come true this time, I'll give up, OK? Here goes:

I think this year UNIX machine prices really will come down. I think the long-awaited SPARC clones will ship, though perhaps not at very aggressive prices, at least at first. That will probably have to wait until 1992.

Unexpected Software Market Award last year went to Windows 3.0, which I predicted would be a huge success, which it was. This year I predict that SPARC machines will pass half a million in installed base. By the end of 1992, I think they'll be past one million. At

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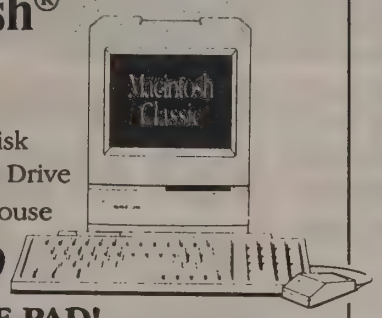

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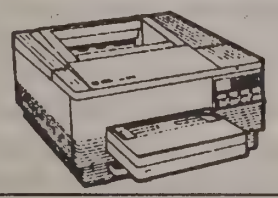

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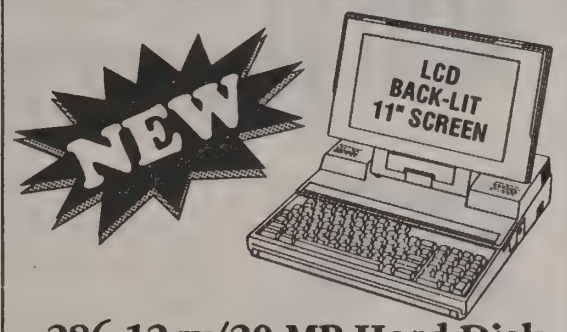

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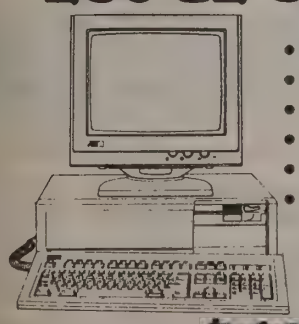

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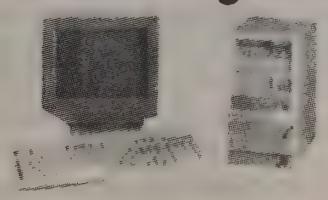

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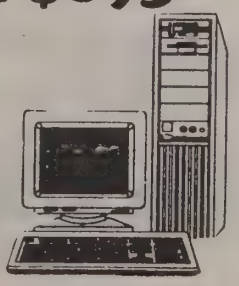

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that point, you've got a significant software market, but just as with Windows 3.0, developers won't realize it's coming until it's upon us. Whether we like it or not (and most of us don't), most of those SPARC applications will be written for Open Look.

This year will be (yet another) mediocre year for NeXT. I predicted bad news for the Businessland-NeXT relationship last year. I think this year, even with the new color, cheaper machines, NeXT still won't ship more than 10% of the machines Sun does. By 1992, with the SPARC clone assault, I think the game will be long over.

This year will be an interesting one for standards. One long-awaited standard, the CEBus home control standard, will reach final status in 1991, and by the end of the year will have a truckload of vendors on board, much to Echelon's chagrin.

This one goes way out on a limb, but I predict that 1991 and 1992 will be bad years for Motorola. I foresee setbacks in the RISC area, in cellular equipment and handsets, in mobile radio, and just about every other core market. By the mid 1990s, I think that Motorola will be in serious trouble. Of course, it'll just blame its problems on the Japanese, and the European Community, and attempt to reimpose trade tariffs on competing products.

Finally, I think that this year will to a large extent vindicate Apple's approach to the low cost market, with sales of the Classic, LC, and IIsi outpacing everyone's expectations.

Steve Costa, BMUG Director: This summer, Apple will make a major announcement about licensing its ROM software to at least three different companies. These new ROM sets will sport special versions of the System that will work on different hardware platforms, including PCs.

A new major Macintosh magazine will hit the scene this summer. It will have a shaky start.

Stephen Howard, BMUG Rhetorician and ex-Board member: During this year, the Prodigy telecommunications service will be revealed to be a financial failure. All other online services will be scrutinized as to whether they're making any money, and will be held up to the great cost/benefits balance.

This will be the year of truth for video on computers. By the end of this year, it will either be cheap enough for everybody to run a TV on their Macintosh screen, or people will have finally lost their interest in this particular weirdness. Users and developers will give it up, because they can't find anything useful to do with it.

Disturbing the technological-recreational entertainment were the news flashes from the congressional vote on the war with Iraq that kept popping up on the desktop. Talk about virtual reality!

David Morgenstern, BMUG CheerLeader and Board member: The wide availability of digital signal processing boards, combined with sophisticated data analysis tools, will be a gold mine to "productivity" consultants to corporate personnel management. The minute-by-minute use of the office copy machine, coffee consumption, and their relationship to a thousand other vital workplace operations will be studied, graphed in color, and recorded. As usual, it will all add up to zero, excluding the consultant's contract.

Hard disk drive cases will get fancier this year. To foil thieves, some drives will be disguised as books, ashtrays, or old pizza boxes. Some drives will have sculptural tops, with statues of the Venus de Milo, Mickey Mouse, or Guy Kawasaki. Clear picture frame covers will allow users to decorate their drive with snapshots of loved ones, or the cat. To keep the cost of high capacity drives down, vendors will sell ad space on cases to beer and cigarette manufacturers, insurance agents, and lawyers specializing in ergonomic disability compensation.

Several Middle East war-inspired virtual weapons of mass computer destruction will fly across the Atlantic to US shores. The Mac community will be spared the byte of this viral terror, since the attacking hackers can only afford DOS-based launchers. ■

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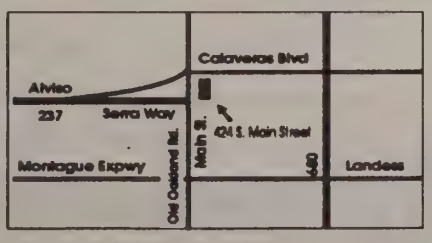

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Calendar Of Events

FEBRUARY

February 19 Adobe Illustrator 88 Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 20 Connectivity Issues For The Nineties Panel Discussion. Foster City. Apple Professional Exchange. Call: (408)980-1957.

February 20 Foxbase Class. San Francisco. Training Works. Call: (415)243-0100.

February 20 Mixing Apples And Oranges: Successful Page Design Seminar. San Francisco. STC. Call: (415)985-7121 or (415)769-9964.

February 20 MS Word I Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 20 The Software Entrepreneur As Wheeler-Dealer Presentation. Palo Alto. SEF. Call: Barbara Cass, (415)854-7219.

February 20 WordPerfect For The Legal Profession Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

February 20–22 The Sixth Annual Image Scanning Conference. Monterey. BIS CAP International. Call: (617)982-9500.

February 21 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

FEBRUARY 21–22

INDUSTRY SYMPOSIUM ON VIRTUAL WORLDS TECHNOLOGY

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This Industry Symposium on Virtual Worlds Technology brings together companies that share a vision to develop virtual worlds technology as a commercial medium. At the symposium you will have the opportunity to experience virtual world environments, meet and hear from leading researchers and industry spokespersons, and discuss opportunities for collaborative research. Contact: Human Interface Technology Laboratory, University of Washington, FU-20, Seattle, WA 98195. (206)543-5075.

February 21 DOS Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

February 21 Electronic Publishing And Prepress Methods For Desktop Publishing Course. San Francisco. UC Berkeley Extension. Call: (415)642-4111.

February 21 Intro To Quark XPress Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 21 Lotus 1-2-3 v2.2 Class. San Francisco. Training Works. Call: (415)243-0100.

February 21–22 First Industry Symposium On Virtual Worlds Technology. Seattle. Human Interface Technology Lab. Call: (206)543-5075.

February 22 Intro To MS Works Database Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 23 Computer Show & Sale. Santa Rosa. East-West Computer Shows. Call: (415)388-8893.

February 23 Computer Swap. San Mateo County Fairgrounds. Computer Swap. Call: 1-800-433-7469.

February 23 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

February 23 The Writer In The Workplace: New Roles For The '90s—A Technical And Professional Communication Conference. Sacramento. STC. Call: Kathryn Jefferies, (916)785-5187.

February 24 Computer Show & Sale. Sacramento. East-West Computer Shows. Call: (415)388-8893.

February 25 DTP Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 25 FileMaker Pro Part 1 Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 25 PageMaker 4.0 For Macintosh Class. San Rafael. Bay Area Computer Training. Call: (415)507-0384.

February 25–26 Downsizing: Gearing Up To Move Down Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 25–March 1 Compcon Spring '91 Conference. San Francisco. IEEE Call: (202)371-1013.

February 25–March 1 Data Base: A Builders Guide Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 25-27 Time Line Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

February 26 Basic Mac Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 26–27 Quattro Pro Session 1 Class. Santa Clara. Training Works. Call: (408)287-8827.

February 26–28 New Office Strategies For The 1990s: Client-Server, Integration, LANs, & GUIs Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 26-March 1 LAN Troubleshooting With Hands–on Ethernet Workshop. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

February 27 FileMaker Pro Part 2 Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 27 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

February 27 Lotus 1-2-3 v2.2 Level I Class. San Rafael. Bay Area Computer Training. Call: (415)507-0384.

February 27 MS Word II Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 27 New Ways To Look At Color: Digital Color Prepress Seminars. San Francisco. AGFA And Adobe Systems. Call: 1-800-227-2780.

February 27 Windows On Novell Network Seminar. Santa Clara. Silicon Valley Novell Network Users Group. Call: Bill Strouse, (408)453-3321.

February 27–28 Novell For System Administrators Class. San Francisco. Training Works. Call: (415)243-0100.

February 28 Adobe PhotoShop Part 2 Class. San Francisco. Abacus Training. Call: (415)759-9508.

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❒ **EGA GAMES #1 (GM105)** Contains Blackjack, Breakout, Asteroids, and Biorym. Great!
❒ **EGA Sorry & EGA Startrek (GM104)** Two popular games. EGA. ❒ **3D-STAR TREK (GM139)** CGA.
❒ **FLIGHT SIMULATOR (GM87)** Try and fly a 747. 60+ pages of documentation.
❒ **ARCADE GAMES (GM125)** A nice collection.CGA
❒ **MONOPOLY v6.7 (GM89)** CGA, **(GM151)** VGA.
❒ **PACMAN CLONES (GM113)** Contains Packgal, Heart, Pacworm & Demon.
❒ **GAMES #5 (GM116)** Artillery, Bricks, Chess88 Asteroids, Seawolf, Wallstreet & more.
❒ **TRIVIA (GM129)** A fun and challenging trivia board game. Supports up to six players. **New.**
❒ **CD-MAN (GM171)** VGA Pacman.VGA req. **NEW.**
❒ **WHEEL #1 (GM92)** Like the famous Wheel of Fortune Game with Vanna. CGA.
❒ **SHOOTING GALLARY (GM144)** VGA. **New.**
❒ **VGA Games #1 (GM122)** Contains VGA MAHJONGG, BANANOID & KALIDESCOPE.**New.**
❒ **CAPTAIN COMIC V3.0 - EGA (GM119)** Fantastic fun game. Adventures with quality graphic animation.

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❒ **PC-CALC+ v2.0, 3 disks (SP16, 17 & 18) New** version of Jim Button's famous spreadsheet pgm.
❒ **123 TUTORS (SP23)** Lotus tutor for beginners; **(SP24)** Advanced Lotus Tutor. Lotus 123 required.

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❒ **COMMAND POST (WN10)** Makes using Windows 3.0 a lot easier.
❒ **Game of TETRIS (WN4)** The most popular game comes to Windows 3.0.
❒ **ICON Editor & 385 ICONS (WN34 & 35)** Icon Editor plus 385 Icon files.
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March 3 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

March 3 Computer Show & Sale. Oakland. East-West Computer Shows. Call: (415)388-8893.

March 4 MS-DOS For CAD Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 4 WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 5 Lotus Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 5–6 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

March 5–7 Windows & OS/2 Conference. San Jose. CM Ventures. Call: (415)601-5000.

March 6 Using The Macintosh To Design Classroom Materials Course. Union City. UC Berkeley Extension. Call: (415)642-4111.

March 6–8 Facsimile And Image Communications Conference. Orlando. BIS CAP International. Call: 1-800-874-9980.

March 7 MS Word For Windows Intro Class. San Francisco. Training Works. Call: (415)243-0100.

March 7 Windows 3.0 & Windows Applications Seminar. Sunnyvale. M & P Computer. Call: (408)738-0304.

March 7 Word For Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 7 & 14 MacroMind Director Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 7–8 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: (415)442-0200.

March 7–May 9 Programming In C Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 9 AutoCAD Operator Certification Examination. San Francisco. State University Extended Education. Call: (415)338-1205.

March 9 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

March 9 Computer Swap. Santa Clara County Fairgrounds. Computer Swap. Call: 1-800-433-7469.

March 9–10 CAD For Managers Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 10 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

March 10–12 Amsterdam Virtual Conference. Amsterdam. European Cyberspace Congress. Call: 31-20-203219, Fax: 31-20-253280.

March 11 Q&A 3.0 Training Seminar. San Francisco. Symantec Training Group. Call: (415)899-7208.

March 11–13 Sixth Annual Computers In Libraries Conference and Exhibition. Oakland. Computers In Libraries. Call: Kim Devan, 1-800-635-5537.

March 11–15 Accounting Solutions: Great Plains Software Training Courses. San Francisco. Accounting Solutions. Call: Binky or Corinne, (415)546-0420.

March 12 Intro To Macintosh Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 12–14 Managing The Dictionary/Repository Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

March 13 Microsoft Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 13 Using FreeHand Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 13 & 14 Quattro Pro Link Class. Santa Clara. Training Works. Call: (408)287-8827.

March 13–15 FMS/AC (CAD Facility Mapping) Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 13–15 Time Line 4.0 Training Seminar. San Francisco. Symantec Training Group. Call: (415)899-7208.

March 14 Excel Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 16 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

March 16 Computer Show & Sale. Sacramento. East-West Computer Shows. Call: (415)388-8893.

March 16 WordPerfect 5.1 Intro Class. San Francisco. Training Works. Call: (415)243-0100.

March 17 Computer Show & Sale. San Rafael. East-West Computer Shows. Call: (415)388-8893.

March 19 Ventura Publisher 3.0/Macintosh Edition Seminar. Sunnyvale. M & P Computer. Call: (408)738-0304.

March 20 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 21 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

March 21 Designing High-Quality User Interfaces Course. Menlo Park. UC Berkeley Extension. Call: (415)642-4111.

March 21 HyperCard Scripting Part 1 Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 21 WordPerfect For The Legal Profession Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 22 Intro To Novell Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 22 MS Word For Windows Productivity Class. San Francisco. Training Works. Call: (415)243-0100.

March 23 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

March 24 Computer Show & Sale. Vallejo. East-West Computer Shows. Call: (415)388-8893.

March 25 MS Word For Beginners Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 25 Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 25–27 Time Line 4.0 Training Seminar. San Francisco. Symantec Training Group. Call: (415)899-7208.

March 25–28 DB/Expo 91: Emerging Tech-

continued

FEBRUARY 20

THE ENTREPRENEUR AS A WHEELER-DEALER

Palo Alto

Peter Peterson, executive vice president of WordPerfect, will speak at a dinner meeting of the Software Entrepreneurs' Forum (SEF). His talk, "The Entrepreneur as a Wheeler-dealer," will discuss creative applications to a simple business philosophy—spend less than you make. Applying this theory has made WordPerfect a multimillion dollar company with no debt. Learn how to apply Mr. Peterson's experience to your business. For reservations and information, contact: Barbara Cass, (415)854-7219.

Calendar Of Events continued

nologies For The '90s. San Francisco. Norm De Nardi Enterprises. Call: 1-800-2DB-EXPO.

March 25–28 First Conference On Computers, Freedom & Privacy. Burlingame. Computer Professionals For Social Responsibility. Contact: 345 Swett Rd., Woodside, CA 94062.

March 25 & April 1 ACT! Class. San Francisco. Training Works. Call: (415)243-0100.

March 26 Intermediate Lotus Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

March 26–29 DB Expo '91. San Francisco. Norm De Nardi Enterprises. Call: 1-800-2-DB-EXPO.

March 28 Mathematical Problem Solving With Mathematica Course. Berkeley. UC Berkeley Extension. Call: (415)642-4111.

March 30 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

March 30 Computer Show & Sale. Santa Rosa. East-West Computer Shows. Call: (415)388-8893.

March 30 Computer Swap. Alameda County Fairgrounds. Computer Swap. Call: 1-800-433-7469.

APRIL

April 2 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

April 2 MS Word For Windows Productivity Class. San Francisco. Training Works. Call: (415)243-0100.

April 3 Intro To WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

April 3 MS Word For Windows Desktop Publishing Class. San Francisco. Training Works. Call: (415)243-0100.

April 3 & 4 Fox Pro Intro Class. Santa Clara. Training Works. Call: (408)287-8827.

April 4 Intro To Lotus Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

April 6 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

April 9 Intro To MS Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

April 9–12 People & Systems: The Software Development Management Conference. San Francisco. Miller Freeman Expositions. Call: JoAnn Tingley, (415)267-7683.

April 9–12 The Software Development Management Conference. San Francisco. Software Development Conferences. Call: (415)995-2472.

April 10 & 11 Quattro Pro Link Class. Santa Clara. Training Works. Call: (408)287-8827.

April 11 WordPerfect For The Legal Profession Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

April 11–12 Western Educational Computing Workshops. Davis. CECC. Call: Judah Rosenwald, (415)338-1212.

April 12 Novell For The End-User Class. Santa Clara. Training Works. Call: (408)287-8827.

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WD1006: $79

ADAPTERS:

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MGP DFI MG160: $29
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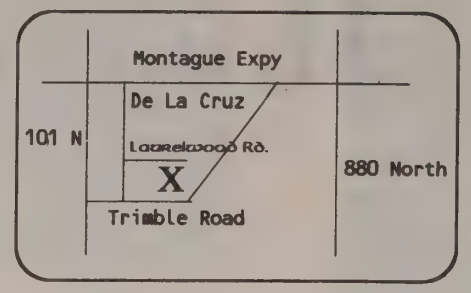

Calendar Of Events continued

April 13 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

April 13 Computer Swap. San Mateo County Fairgrounds. Computer Swap. Call: 1-800-433-7469.

April 13 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

April 13 WordPerfect 5.1 Productivity Class. San Francisco. Training Works. Call: (415)243-0100.

April 14 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

April 15 MS Word For Windows Intro Class. San Francisco. Training Works. Call: (415)243-0100.

April 15 Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

April 17 MS Excel Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

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- **SANTA CLARA COUNTY FAIRGROUNDS**
  Santa Clara, CA • March 9, 1991
- **ALAMEDA COUNTY FAIRGROUNDS**
  Pleasanton, CA • March 30, 1991
- **SAN MATEO COUNTY FAIRGROUNDS**
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- ☐ 1:1 Interleave 2 FD/2 HD Controller
- ☐ 1.2 MB 5¼" Floppy Drive
- ☐ 2 Serial/1 Parallel
- ☐ AT Case With Power Supply
- ☐ 101 Enhanced Keyboard

MONTHLY SPECIALS

100 MB CONNER CP3104 . . . . $490 qty 20
FUJI 90 MB HARD DRIVE. . . . $399 qty 10
WD 85 MB HARD DRIVE . . . . $399 qty 20
WD ESDI 1:1 2FD/2HD
CONTROLLER . . . . . $124 qty 20

HARD DRIVES

20 MB ST-225, 65ms . . $184
40 MB IDE 218
66 MB Toshiba 134FA, 25ms 335
90 MB Fuji, 24 ms 440
110 MB NEC D3661, 18ms 610
150 MB NEC 5655, 18ms 745
330 MB XT-4380, 18ms. 1268

VIDEO CARDS

Mono Graphics w/P . . . $20
Color Graphics w/P 35
EGA 55
VGA (800x600) 59
VGA (1024x768) 89
ATI (1024x768, 512K) . . 188
Video 7 VRAM 1024x768, 512K) 398
VGA (1024x768, 1 MB) 135

FLOPPY DRIVES

360KB 5¼" Teac/ Mitsumi $65/62
720KB 3½" Teac 69
1.2 MB 5¼" Teac/ Digital Sys. 68/65
1.44 MB 3½" Teac/ Mitsumi 66/63

PRINTERS

Panasonic KX-1180 . . . $155
Panasonic KX-1124 . . . 280
Panasonic KX-1524 . . . 448
Panasonic KX-1624 . . . 360
Star NX-1000 160

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MFM (1:1) 2 FD/2 HD. . $72
RLL (1:1) 2 FD/2 HD . . . 95
ESDI (1:1) 2 FD/2 HD . 138
XT 2 HD 46
IDE (1:1) 2 FD/2 HD. . . . 25

MONITORS

12" Mono. $68
14" Mono 94
RGB Color 194
EGA 288
VGA 308/278
Super VGA (0.28, 1024x768) . . . 345
NEC 3D 588

MISC.

I/O (2S/1P/1G) $20
2400B Modem (int) 59
2400B Modem (ext) 79
FAX/Modem 188
Logitech C9 Ser/Bus Mouse . . . 68/72
Smart Mouse. 29
Tape Back-Up Drive . . . 285
101 Enhanced Keyboard 38
MS DOS 58
Tower Case 150
Mini Tower Case 110
Regular AT Case 52
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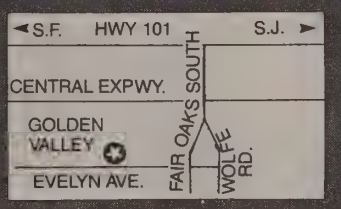

HARDWARE

BUYERS GUIDE

486 33 MHz

15 MIPS

$3395

Standard Configuration

- Intel 80486/33 CPU
- Fast 70ns, 4MB memory
- 8KB Cache Intergrated in CPU
- Math Coprocessor Intergrated in CPU
- Very Fast 200MB IDE Hard Disk Drive 15ms Access time w/ 32KCache
- IDE Controller
- 1.2 MB or 1.44MB Teac Floppy Drive
- 2 Serial / 1 Parallel
- 101 Keytronics Keyboard
- 230W Power Supply
- Desktop Case
- Built-in Real Time Clock

Feature

- Memory expandable to 16MB
- Second Level Cache Memory expandable to 512KB
- Burst Mode Memory Transfer
- Weitek 4167 Numeric coprocessor support
- 32 Bit memory expansion slot
- Six 16-bit, Two 8-bit expansion slots
- Phoenix or AMI BIOS
- 1 Year Warranty

Made In U.S.A.

CAD/CAM, LAN, UNIX, XENIX, Window 3.0....

EXP 486 / 386 / 286 SYSTEM PRICE LIST

MODEL	Basic	Monochrome System price	VGA(1024x768) System price
486/25	1895	1995	2390
386/33 (64KB Cache)	1295	1395	1790
* 386/25 (32KB Cache)	1195	1295	1690
386/25	995	1095	1490
386SX/16	745	845	1240
286/12	495	595	990

Options

40MB HDD	250
80MB HDD	450
100MB HDD	485
150MB HDD	850
200MB HDD	795
338MB HDD	1495
676MB HDD	2195

Basic System Configuration

- 1MB Memory
- Desktop Case
- Real-time Clock
- 230W Power Supply
- Coprocessor Socket
- 1:1 Interleave IDE Cont.
- 1.2MB or 1.44MB Floppy Drive
- 101 Keyboard (Click or non Click)
- 2 Serial / 1 Parallel / 1 Game Port
- Made in U.S.A.

* BYTE LAB
First Choice
April, 1990 (P130)

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AutoCad users can get the 2048X2048 resolution on your standard monitor. The CAD RACE VGA adapter let you transform your system into a high-resolution graphics workstation for a fraction of the usual cost.

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* With 1MB **$475**

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"The Diamond VGA adapter proved the fastest graphics board that PC Labs has yet tested"
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- Wide range of drivers
- Trident 8900 Chipset

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- .28 mm Dot pitch

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Number Nine Graphics Xccelerator

- TI 34010, 60MHz graphic processor
- 1024x768N (Max, 1280x1024)
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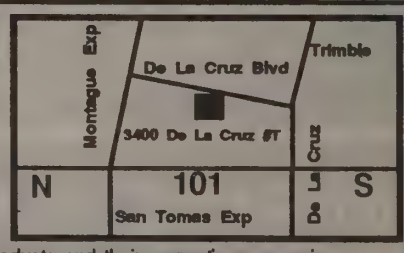

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* Prices subject to change without notice. * All prices reflect a cash discount.

HARDWARE

BUYERS GUIDE

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The one of the best graphic card. Monochrome to VGA(1024X768), 2 to 16.7 million colors for photographic quality.

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-T.I. 34010 Graphic Processor at 60 MHz
-1MB VRAM, 2MB optional program memory
-Up to 5 times faster for AutoCad & Window
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The Hercules Graphic Station Card and LUMENA/Hercules software provides the most exciting tools for advertising and design agencies, coporate art departments and other visual artists.

With Hercules Art Dept., logos, ads and literature or packaging comps can be rendered in hundreds of different styles, colors and layouts.
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Monitor / Graphic Card

Monitor

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-HL6615TK, 16", VGA to 1280X1024N	1145
-HL6905TK, 20", VGA to 1280X1024N	1999
HITACHI	
-CM2085, 20", VGA to 1280X1024N	1949
-HM4319D, 20", VGA to 1280X1024N	1995
-HM4119DDL, 20", 1024X768N	2199
-HM4119DAA, 20", 1280X1024N	2299
NEC	
-NEC 4D, 16" VGA to 1024X768N	1199
-NEC 5D, 20" VGA to 1280X1024N	2295
PHILIPS	
-C1764, 17" VGA to 1280X1024N (Flat)	1499
-C2064, 20" VGA to 1280X1024N	2095
NANAO	
-9070S, 16", 20-50KHz 1024X768N	979
-9400, 20", VGA to 1280X1024	2615

Graphic Card

CONTROL Systems	
-XJ10, 1024X768N or 1024X1024I	1695
-XJ12, 1280X1024N or 1024X1024N	1999
METHEUS	
-UGA1104, 1024X768, 48.8KHz	895
-UGA1224, 1280X1024, 64KHz	1295
NEC Graphics Engine	
-MGE AT/16, 1024X768N, 16 Color	695
-MGE AT/256, 1024X678N, 256 Color	995
Sota Technology	
-340i, 1024X768N, 16 Color	695
RENAISSANCE GRX	
-Rendition II/16, 1024X768N	995
-Rendition II/256, 1024X768N	1395
HERCULES GRAPHIC STATION	
-1024X768, 256 Color	795
HP GRAPHICS CARD	
-IGC10, 1024X768, TI 34010	850
-IGC20, 1280X1024, TI 34020	1995

Call for other Monitors & Graphic Cards

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IMAGE-IT is a low cost, yet powerfull adaptor. Application for IMAGE-IT include Desktop Publishing, Image Databases, Presentation Graphics and Computer Aided Instruction.

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-JetReader Page Feeding Scanner	925
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MITSUBISHI	
-Page Scanner with paper feed	745
-Page Scanner with 16 grey	665
MICROTEK LAB	
-MSF-300G 300 dpi Gray	1495
-MSF-300Z 16 mil Col, 256 Gray	1985
-MSF-400GS 400 dpi Gray	2895

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MSF-300Z delivers state of the art 24bit color images. Scan color photographs and drawings at up to 300dpi.

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This capability allows you to save significant disk space on images that don't require color or gray-scale data.

*** Complete Scanning / Editing Software**
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*** IOLINE 3700 Plotter**
A-D size, cut and roll system
*** IOLINE Vinyl cutter**
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*** Letter Art software**
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Plotter / Digitizer

Plotter

CALCOMP	
-1023, A-D, 8 Pen	3495
-1025, A-E, 8 Pen	4575
-1044GT, A-E	8895
HOUSTON Inst.	
-DMP61, A-D	2999
-DMP62, A-E	3999
-Option for Multipen	469
IOLINE	
-3500, A-D, 1 Pen	2299
-3700, A-E, Cut & Roll	2999
-4000, A-E, 20 ips	3499

HP Plotter	
-HP7440A, A, 8pens	1095
-HP7475A, A-B,6 pens	1450
-HP7550A, A-B,8 pens	2995
-HP7570A, C-D,8 pens	2995
-HP7575A, A-D,8 pens	3695
-HP7576A, A-E,8 pens	4795
-HP7595B, A-E,8 pens	6695
ENCAD Plotter	
-SP600, A-B,6 pens	695
-SP1800, A-D,8 pens	3435
-SP2800, A-E,8 pens	4365
-SP4810, A-C, Cut,Roll	3595

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SUMMAGRAPHICS	
-SummaSketch II 12x12	369
-SummaSketch II Pro	639
KURTA	
-12X12, Cur. & Stylus	389
-12X17, Cur. & Stylus	649
CALCOMP	
-12X12, Cur. & Stylus	329
-12X18, Cur. & Stylus	655
-18X24, Cur. & Stylus	1325
-24X36 (2300 Series)	1595
-36X48 (2300 Series)	1795

USER GROUP NETWORK

BULLETIN BOARDS

408

24-Hours-a-Day BBS. (408)448-1126. 24 hrs., 300/1200/2400. Fido Node #:1:143/302. 12 Step Programs including AA, NA, CA, GA, Al-Anon. Echos: Recovery, 12 Step, OASIS and others. Sysop: Mike R. [Exp. #81.]

Bay Area Atari Users Group (BAAUG) BBS. (408)986-0215. 8-N-1, 24 hrs. Sysop: Joe Fischer. [Exp. #81.]

Code Room. (408)266-3818. 8-N-1, 300/1200/2400. A Programmer's BBS, tons of C files! Doors/messages. Sysop: Ramin Akhbari. [Exp. #81.]

Consumers BBS And Insurance Center. (408)378-0626. 24 hrs. Rate your own auto insurance. Buy/sell a car. Shop in our garage sale. See if your car has been recalled. Sysop: David McCoy. [Exp. #80.]

Cruzio. (408)423-9995. 1200/2400. If dialing in @ 1200 baud, send Crtl–C on connect. Serving local Santa Cruz Co. with calendar, directory, conferencing, email and USENET newsgroups. Sysop: Chris Neklason and Peggy Dolgenos. [Exp. #80.]

Dirt Alert OHV BBS. (408)247-3229. 8-N-1, 24 hrs., 300/600/1200/2400. Text only OHV environmental activists BBS for the protection and preservation of Off Highway Vehicle areas. [Exp. #81.]

Diversified I/O BBS. (408)745-7026. 8-N-1, 24 hrs., 300/1200/2400. Product info and tech support for Diversified I/O Macintosh software. Sysop: Diversified I/O, Inc. [Exp. #79.]

Lynn-Western Newswires. (408)778-5994 & 778-9656. 8-N-1, 24 hrs., 1200/2400. FidoNet 1:143/304. Professional information on technology, management, and worldwide investment news. Stock Market data online. [Exp. #80.]

Macrocosmic BBS. (408)985-0773. 8-N-1, 24 hrs., 300/1200/2400. Hundreds of megabytes of files for the Macintosh. Sysop: Robert D. Matthews. [Exp. #80.]

P.I.E. (Programming And Interfacing Enthusiasts) BBS. (408)733-4670. Sysop: Clay Walker. [Exp. #81.]

Pacific Exchange. (408)946-8561. 10 data lines, over 11,000 IBM files, UPI News, restaurant dBASE, Weekly Entertainment Review, and more. Sysop: Ed Peterson. [Exp. #81.]

Portal System (TM). (408)725-0561. 8-N-1, 24 hrs., 300/1200/2400/9600. Multiuser chat, games, SIGs, email, Usenet, and more. Dial direct or use Sprintnet/Telenet or PCPursuit. [Exp. #81.]

Ring-Of-Fire. (408)453-3326. 24 hrs., 2 nodes. Silicon Valley Novell Users and United Sysop's Association. Online games. Active since 1982. [Exp. #80.]

Santa Clara County Atari User Group BBS. (408)848-6032. 300/1200/2400. [Exp. #81.]

SCV-TICP, Silicon Valley Refuge of TI Pro Users. (408)296-2503. 8-N-1, 24 hrs., 300/1200/2400. Sysop: Mark Cantrell. [Exp. #81.]

The Moose Is Loose BBS. (408)773-9573. 1200/2400/9600. The best msg. base under Sunnyvale's fruit can. Sysop: John Giever. [Exp. #80.]

The Silicon Matchmaker. (408)248-6062. 24 hrs., 300/1200/2400. Electronic PenPal network. Twelve lines. [Exp. #80.]

Vietnam Veterans Valhalla. (408)298-2740. 8-N-1, 24 hrs., 300/1200/2400/9600. Fidonet 1:143/27. Veterans' benefits, International EchoConference, NAMVET Newsletter, Recovery system. [Exp. #81.]

415

& the Temple of the Screaming Electron. (415)935-5845. Raw data for raw nerves, home of NIRVANAnet(tm). Sysop: Jeff Hunter. [Exp. #81.]

AC Co-Op BBS. (415)523-1268. 8-N-1, 2400. Public domain/shareware, message base, Q/A, registration. Sysop: Doyle Dewberry. [Exp. #81.]

AIDS Info BBS. (415)626-1246. 8-N-1, 24 hrs., 1200/2400. 25Mb dBASE with index, keyword search, online help instructions, no chat. Topics on AIDS including read/write discussions, articles, stats, resource contacts, and private email between users. Text only. Sysop: Ben Gardiner. [Exp. #80.]

Amiga Barber Shop. (415)261-1001. 24 hrs., 1200/2400. 53Mb all Amiga files. Sysop: Blade. [Exp. #80.]

Anatomically Correct BBS. (415)967-4265. 2400. Free, adults only, unique "chat." Sysop: Howeird. [Exp. #80.]

BayTalk BBS. (415)864-6430. 8-N-1, 24 hrs., 300/1200. The number one electronic source for text of legislation concerning people with disabilities and catalogs of products for people with visual impairments. [Exp. #81.]

BBS Of San Francisco Apple Core. (415)563-8652. 24 hrs., 2400. Lots of fun, supports Apple II and GS computers. [Exp. #80.]

Beggar's Tomb. (415)641-5123. IBM file, msg. bases, adult areas, online games and more. Free. [Exp. #81.]

Bizarre Bazaar BBS. (415)821-4832. 300/1200. WWIV 4.12 software, bilingual (Esperanto) message base and uploads. [Exp. #80.]

Breaking Walls; Building Bridges. (415)827-0804. 24 hrs., 300/1200/2400. Church, gays/lesbians, community, AIDS. Forums, news, confidential mail, care. Sysop: Deacon DVMCC. [Exp. #80.]

Bultenejo Bizara Bazare. (415)821-4832. 300/1200. Programaro WWIV 4.12. Dulingvaj mesagharoj kaj sharghfakoj. Ankau komputiloj estas verdaj! [Exp. #80.]

California ConneXion Partyline. (415)927-2739. 8-N-1, 24 hrs., 300/1200/8400. 300Mb, 9 lines, chat, worldwide network, 25+ pubs, matchmaking, adults only. Reg required. [Exp. #79.]

Castle Of Blackthorn. (415)638-2937. 24 hrs., 300/1200/2400. Files & msg. bases for Atari, IBM, Mac, and Commodore. Over 19 online games. Sysop: Blackthorn and British. [Exp. #80.]

Coconino County. (415)861-8290. 12–14400. FidoNet and RBBS-Net email, QWK Door, IBM and assorted topics. [Exp. #81.]

Compact Disc Exchange. (415)824-7603. 24 hrs., 300/1200/2400. Online CD exchange network. Buy/sell used CDs and collectable discs. Voice: (415)826-9350. Sysop: Wayne Gregori. [Exp. #81.]

CWEST Color Commodore. (415)552-9320. [Exp. #80.]

E-MAP/MapNet. (415)256-6551. 24 hrs., Street directions, address to address in the USA and Canada. [Exp. #80.]

Freedom BBS. (415)683-9560. 24 hrs., 300/1200/2400/9600. Political bulletin board. All views aired and accepted. Intelligence is a prerequisite. Sysop: Dennis H. Medley. [Exp. #80.]

Goal Getters BBS. (415)383-3208. Goal Getters Set Goals. Access Resources. Go for it! Voice: (415)389-6360, Mill Valley. [Exp. #81.]

Guideboard. (415)864-3858. 24 hrs., 300/1200/2400. Multi-line, Cabbie's Guide to SF. Where to go for restaurants, doctors, auto repair, etc. Sysop: Dick Schwartz. [Exp. #81.]

HTG/Outreach BBS. (415)572-9594. 8-N-1, 24 hrs., 300/1200/2400. High tech gays/lesbian/bisexual/transgender, 4-line, TBBS, security clearance info., activities calendar, GGBA electronic dictionary, echo conf, CB chat, files, free & open access. Sysop: Sagittarius. [Exp. #80.]

IDC BBS. (415)865-7115. 8-N-1, 1200/2400/9600. 100Mb, 500+ conference areas, Intelec Net, SmartNet, RIME, InterZone, V-Net. PCBoard, MarkMail, Qmail 4.0. Sysop: Mike King. [Exp. #81.]

Jobs-on-line. (415)324-3780. 8-N-1, 300/1200/2400. 16-line High-tech Employment/Business, opportunity search service. [Exp. #81.]

Just Say Yes! Freedom Of Information. (415)922-2008. Home of NIRVANAnet(tm). Sysop: Dr. Strangelove. [Exp. #81.]

KayFun Bulletin Board. (415)571-9259. 24 hrs., 300/1200/2400/9600. CP/M and DOS. Sysop: Bob Wallace. [Exp. # 81.]

MacCircles BBS. (415)484-4412. 8-N-1, 24 hrs., 9600. FidoNet echoes, USENET newsgroups, local conversations, files, games. Two open lines, all welcome. Sysop: Patricia O'Conner. [Exp. #80.]

Opportunity Network BBS. (415)673-4080. Jobs/Candidates for computer professionals. Voice, (415)673-0802. Sysop: Kathleen McMahon. [Exp. #81.]

Over My Dead Body BBS. (415)465-7739. 8-N-1, 24 hrs., 300/1200/2400. RBBS system for mystery fans. Sysop: Cherie Jung. [Exp. # 80.]

Palo Alto Writer's Most Echoes OPUS. (415)322-6451. 6:00 pm–8:00 am. Echo areas: writing, and words_words. No charge. A few shareware files. Moving to 9600 bps soon. [Exp. #80.]

Psychic Link BBS. (415)849-3539. 2400. 2 lines, psychic and spiritual matters demystified and brought into plain sight. Sections for Mac, Amiga, PC and Atari. Sysop: Harpreet Sandhu. [Exp. #81.]

Recovery BBS. (415)223-1119. 300–9600. AA, NA, Al-Anon/ACA, SLAA. Recovery and 12 Step Echos. Fido 125/9. Sysop: Rich Gorlin [Exp. # 80.]

Running Wyld. (415)368-5685 (9600); 365-9079 (2400). Graphic image center, 500Mb. Sysop: [Exp. #81.]

SeaHunt BBS. (415)344-4348. 2400/9600. FidoNet, Intelec Net, 650Mb, 75 conferences, 16 Doors. Sysop: Michael Neslon. [Exp. #81.]

SFPCUG. (415)621-2609. 8-N-1, 300/1200/2400/9600. Email, ul/dl messages, files. Voice: (415)621-1908. [Exp. #80.]

Skeptic's Board. (415)648-8944. Paranormal/fringe science issues, Bay Area Skeptics. Recording, (415)LA-TRUTH. Sysop: Rick Moen. [Exp. #81.]

StarComm BBS (415)922-5628. 300/1200/2400. ANSI/NON-ANSI, MS-DOS compatibles system, online games, file sharing, 20Mb of downloadable files. Sysop: Starbuck. [Exp. # 80.]

Starnet Connections. (415)949-3133. 8-N-1, 24 hrs., 300–19,200. Email, USENET, UNIX, and more. Sysop: Richard Mahn. [Exp. #81.]

SuperResume. (415)524-0416. 8-N-1, 24 hrs., 300/1200. Free features include: Software Engineer Resume Composition Outline, Software Career Strategy Conf., job listings. [Exp. #80.]

The Abyss BBS. (415)482-5813. 24 hrs., 300/1200/2400. IBM/Mac, file & msg base, email. Sysop: Keymaster [Exp. #82.]

The Interlude BBS. (415)458-4344. 8-N-1, 8:00 pm–2:00 am, Wed. to Sun. Matchmaking, singles, personal ads. Sysop: Ed Tausing. [Exp. #80.]

The Job Xchange. (415)226-6160. 24 hrs., 1200/2400. MNP5. An online computer industry system. Free for job seekers and employers. User friendly. Sysop: R. Cassidy. [Exp. #80.]

The KayFun Computer Club. (415)571-9259. 24 hrs., 300/1200/2400. CP/M and DOS, 230Mb storage, online echomail. Sysop: Bob Wallace. [Exp. #80.]

The LAB. (415)753-3238. 24 hrs., Performing, Fine, MIDI and Graphics Arts. Users portfolios, msg bases, and files. [Exp. #80.]

The Network BBS. (415)795-4268. 24 hrs., 300/1200/2400/9600. Over 600Mb files, also Novell, Clipper, C, dBASE, and accounting msg. areas. 9 multi-user online games. [Exp. #81.]

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Viper 1 Premium BBS. (415)535-0231. 8-N-1, 6 pm–midnight, Mon.–Fri., all day Sat. & Sun., 1200. Online games, 42 download areas. Soon to come: online hard disk backup, fax, 2400–38400 bds, and more. [Exp. #80.]

Wetware Diversions. (415)753-5265. 8-N-1, 24 hrs., 1200/2400. Multi-line, PC Pursuitable, San Francisco's Public Access UNIX System. (cc@wet.UUCP) Sysop: Christopher Cilley. [Exp. #81.]

Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software. Info., shareware, chat. Sysop: Bob Cram. [Exp. #81.]

Windows Online. (415)930-8384. 1200/2400/9600/14400. PCBoard, 778Mb, everything for Windows users. Tons of new files everyday & friendly support. [Exp. #81.]

707

The Power Station. (707)552-0462. 300/1200/2400. Node 2, (707)554-8612; Node 3 (707)645-8780. 415Mb online, supporting IBM and Amiga. [Exp. #81.]

1-800

Drug Abuse Information (DAIMP). 1-800-825-3736. 8-N-1, 24 hrs., 300/1200/2400. Drug information, statistics, bibliographies, forums, email, downloads and uploads. Free membership, reg. requested. Sysop: Greg Cason. [Exp. #81.]

916

For Adults Only. (916)944-7861. 8-N-1, 24 hrs., 300/1200/2400. 16 lines, adult fines and contacts. [Exp. #80.]

continued

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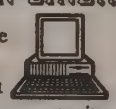

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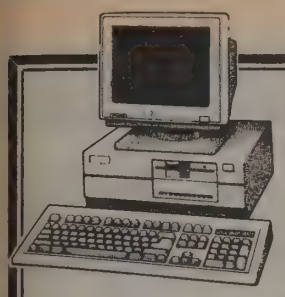

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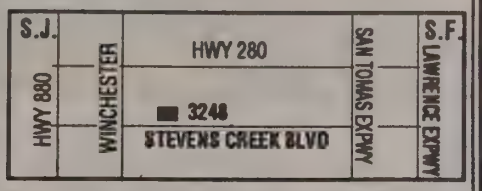

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Artificial Intelligence Association. Individuals interested in learning about the use and application of AI. Call: Rita Zokaei, (415)574-8225. [Exp. #80.]

Computer Professionals For Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, room 608-7. Call: Judy Stern, (415)643-7499. [Exp. #84.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #84.]

Independent Computer Consultants Assn. Referral Service. Designed to give public access to the knowledge and experience of Assoc. members, no fee. Call: Referral Service Hotline, (408)980-7272. [Exp. #80.]

Independent Computer Consultants Association. Meetings: 3rd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #80.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. Call: September Jenner, (408)971-2336. [Exp. #83.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #80.]

The Association For Worldwide Software Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #84.]

United Sysops Association. Meetings: 2nd Wed, 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Assoc. for system operators and BBS users. Call: Bill Strouse, (415)453-3321. [Exp. #84.]

Women's Computer Society. Call: Tanya Halepota, (415)949-3936. [Exp. #80.]

Writer's On-line Association Of Technical Communicators. Meetings: Weekly, Berkeley. Call: Cynthia Kolnick, (415)673-5819. [Exp. #80.]

USER GROUPS

ACCOUNTING

Accounting East Bay User Group. Meetings: 4601 Clipper Ct., Fremont. Call: Phrede Deese, (415)657-5880, BBS (415)795-4268. [Exp. # 80.]

Champion Accounting Systems User Group. Fremont. Newsletter, BBS, ideas and help. Call: Garhart, (415)657-5880. [Exp. #84.]

On-line Accounting Users Group. Call: Bob, (415)686-3304. [Exp. #80.]

San Francisco Bay Area Platinum User Group. Call: Steve Koss, (415)562-2754, or Jim Britton, (415)576-3209. [Exp. #81.]

AMIGA

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary. Call: (415)584-8406. [Exp. #83.]

COW—Commodore Owner's Workshop User Group. Meetings: 3rd Thurs., 7:00 pm, San Bruno Parks & Rec Bldg. No dudes! Call: Steve Beale, (415)355-8927, BBS (415)359-5975. [Exp. #81.]

FAUG—First Amiga User's Group. Meetings: 1st Tues., 7:00 pm, Palo Alto Hyatt. Call: Mike Fisher, (415)855-9426, BBS (415)595-2679. [Exp. #84.]

APL

APL Bay Area Users Group. Meetings: 2nd Mon., 7:00 pm. Variable. Call: Tibor Horvath, (415)283-5611. [Exp. #83.]

APPLE

GravenStein Apple IIGS User Group. Meetings: 3rd Sat., 10:00 am, West America Bank, McDowell Ave, Petaluma. Call: (707)763-1428. [Exp. #80.]

San Francisco Apple Core. Meetings: 3rd Tues., 7:00 pm, SF State University, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #84.]

AT&T UNIX

AT&T Computer User Group-North Bay. Meetings: 1st Wed., new user education, 6:00 pm, program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #84.]

AT&T Computer User Group-South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #84.]

AT&T Computer Users Group. Meetings: 2nd Wed., 6:30 pm. Refreshments, technical support and informal discussions. Also, Sunnyvale DOS and UNIX groups. Call: Jim Lansing, (415)885-6631. [Exp. #84.]

AT&T UNIX Computer User Group-South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #84.]

ATARI

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Hospital Auditorium, Palm Rd. and Circle Dr., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #84.]

COAST (CA Original Atari ST User Group). Meetings: 3rd Wed., 6:45 pm, 550 El Embarcadero, Oakland. The 1st Wed special beginners met for members. Call: (415)945-1949. [Exp. #80.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Public Library. Atari Club, 8/16/32-bit. Call: Keith Sammons, (415)887-2008. [Exp. #84.]

Santa Clara County Atari Users Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computer Showroom, 1278 Alma Court. Formerly South County Atari Users Group. Call: Ron Reade, (408)225-7162, BBS (408)848-6032. [Exp. #84.]

CAD/CAM

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #84.]

Marin ACAD User Group. Meetings: 1st. Thurs. Call: Gigi Bollinger-Himes, (415)491-4722. [Exp. #80.]

S.F. AutoCAD User Group. Meetings: 1st Mon., 6:30 pm, SFAIA, 130 Sutter St., 6th fl. Call: Katie Price, (415)923-9228. [Exp. #81.]

SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #84.]

Textile Computer Users Group—TCUG. Meetings: Bimonthly, 1st Sun., 10:00–noon. Bedford Hotel, San Francisco. Call: (415)284-1635. [Exp. #84.]

COMMODORE

Cupertino Chapter Of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #84.]

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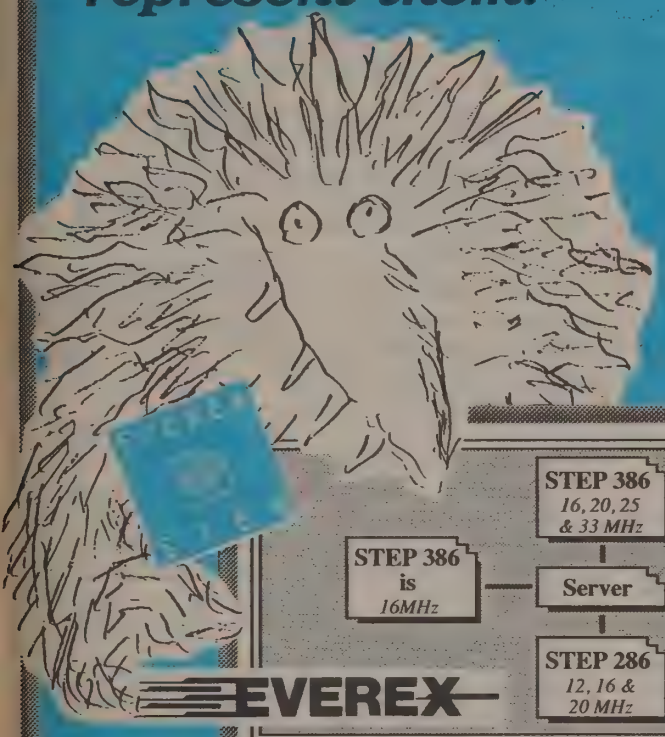

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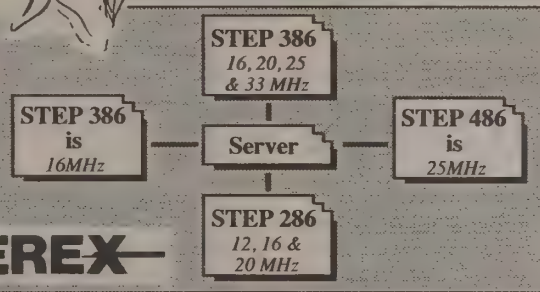

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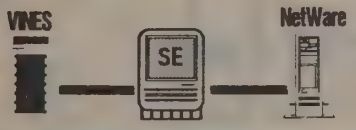

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dBASE

dBASE IV SIG. Meetings: 1st Tues., Ashton-Tate, 6411 Guadalupe Mines Rd., San Jose. SIG of the Silicon Valley dBASE Language Group. Call: Charles King, (408)724-7024. [Exp. #84.]

dBASE SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 333 California St., San Francisco. Call: Mark Webster, (415)647-3675. [Exp. #83.]

SQL_Forum. Meetings: 1st Thurs., 6:30 pm, 394 Pacific Ave., San Francisco. Topics include client/server computing & SQL database servers. Speakers, demos. Call: (415)695-2748. [Exp. #83.]

DESKTOP PUBLISHING

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:00 pm, 660 Market St., Ste. 215, San Francisco. Call: Eric Leong, (415)635-0159. [Exp. #83.]

San Mateo Ventura Publisher Users Group. Call: Elinor Cruz, (415)366-5317. [Exp. #81.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #80.]

GENEALOGY

Contra Costa County Genealogical Society/Computer User Group. Meetings: 1st Sat. of odd-numbered months. Call: Susan, (415)372-6996. [Exp. #80.]

Contra Costa PAF User Group. Meetings: Last Sat., Call: Susan, (415)372-6996 or Julia, (415)933-6555. [Exp. #80.]

IBM AND COMPATIBLES

Berkeley PC/Compatible User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle, 2618 Telegraph Ave. Call: (415)845-4814 or (415)526-4033. [Exp. #80.]

Compatible User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle Systems, 2618 Telegraph, Berkeley. Call: Mel Mann, (415)526-4033. [Exp. # 80.]

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #81.]

Desktop Video SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: Mike Shurtz, (415)522-1797. [Exp. #83.]

DESQView SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Visitors $3. Call: Adam Baum, (415)841-5628. [Exp. #83.]

EastBay FOG. Meetings: 2nd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #80.]

GeoWorks SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: Larry Yurdin, (415)527-2647. [Exp. #83.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon. 7:30 pm, San Rafael Community Center. Call: (415)927-2909. BBS (415)927-1216. [Exp. #83.]

Hypertext/Hypervideo SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: M. Mallicot, (415)922-1587. [Exp. #83.]

Investments SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: Richard Haven, (415)566-8076. [Exp. #83.]

Lotus 1-2-3 SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Call: Jerry Stern, (415)566-9675. [Exp. #81.]

PC BasicS. Meetings: 3rd Mon., 7:30 pm, Micro Age Computers, Sunnyvale. SIG of Silicon Valley Computer Society. Call: (415)326-2435. [Exp. #80.]

PCjr SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors $3. Call: John King, (415)472-7035. [Exp. #83.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm, Donatello Hotel at Post and Mason. Call: (415)788-5388. [Exp. #80.]

San Francisco PC Users Group. Meetings: 3rd Mon., 7:30 pm, UCSF Laurel Heights, 333 Califronia St., San Francisco. Call: (415)221-9166, BBS (415)621-2609. [Exp. #82.]

San Lorenzo User Group. Meetings: 2nd Tues. and the 20th, 7:00 pm, Gathering Place in Ben Loman, Santa Cruz County. Call: Chuck Schafer, (408)338-7348, BBS (408)335-4672. [Exp. # 81.]

Stanford/Palo Alto Users Group For PCs. Meetings: Last Wed., 7:30 pm, Stanford Campus, Jordan Quad, Polya Hall, Turing Aud. Call: (415)329-8252. [Exp. #80.]

WordPerfect SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Visitors $3. Call: Kendall Callas, (415)821-1310. [Exp. #83.]

KNOWLEDGEMAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm. JNZ, Inc., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (415)947-4878, BBS (415)935-4878. [Exp. #84.]

LAPTOPS

Bay HPX HP Laptops & Handhelds. Meetings: 2nd Sat. Call: Michael Felsenstein, (415)564-8279. [Exp. #84.]

MACINTOSH

Mac SIG DUAU. Meetings: 3rd Tues., 7:00 pm, Willow Creek Center, 1026 Mohr Lane, Concord. The perfect place for beginners and old timers. Call: (415)676-9905. [Exp. # 80.]

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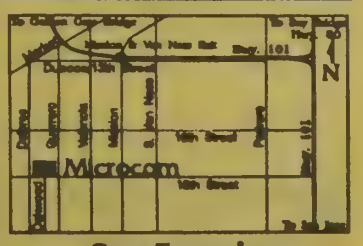

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Macromind Multimedia User Group And Video SIG. For more information, call: (415)442-6200. [Exp. #83.]

The International Interactive Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #80.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)453-3321. BBA (408)453-3326. [Exp. #84.]

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Smalltalk VPM Experts. Meetings: 3rd Thurs., 7:30 pm. Call: Dave Hurrell, (408)866-4647. [Exp. #81.]

PARADOX

Bay Area Paradox User Group—BAPALS. Meetings: 4th Tues., 4:00 pm, SF State University Downtown Campus. Forum for users and developers at all levels. Call: Robert Smiley, (415)957-4656. [Exp. #81.]

Paradox SIG/SFPCUG. Meetings: 3rd Mon., 6:15, UCSF, 333 California St., San Francisco. Call: Richard Haven, (415)566-8076. [Exp. #83.]

R:BASE

R:Base Users Group Of The East Bay. Meetings: Last Thurs., 9:00 am. Call: Longwell Assoc., (415)451-5316. [Exp. #80.]

TEXAS INSTRUMENTS

Texas Instruments Professional Computer Users Group. Meetings: 4th Thurs., Magnolia Inn, 176 S. Bernardo, Sunnyvale. Call: Thor, (415)386-5237, or Dr. Bill, (415)671-5237. [Exp. #81.]

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UNIX SIG/SFPCUG. Meetings: Last Wed., 7:30 pm, Call: John Tait, (415)386-9230. [Exp. #83.]

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Continued from page 48

was what would happen if, after you cracked into a system, the system basically dumped its guts on your line, so it shows up on your terminal and there's no way you could cut it off. That kind of thing, that would change it.

The problem is, you can hang up.

I think what triggered the discussion was the analogy that some mall was concerned about teenagers loitering in the store, and they were scaring away customers or whatever. So they found they could get rid of the teenagers by changing the music. Put on classical music and the teenagers disappear.

There's a guy at IBM who had a neat idea—he developed a prototype of a system so that if someone cracks into the system he gets thrown off into some subsystem where he can't harm anything. He can't do anything very interesting either.

A sandbox. Well, I'm glad to hear that people are thinking about these things.

I keep thinking that maybe we should have a lot more opportunities for real human-level interaction between the computer security folks and the kids themselves.

I'd like to see that happen. I'd like to see them all get together at a conference sometime and talk to each other. I don't know if that's realistic.

There's something brought to mind by the subject of [SRI computer security expert] Donn Parker, which is the extent to which private or semiprivate computer security consultants have no economic interest in diminishing the perception of the problem. Donn, for example, has fifty-two corporations paying SRI $50,000 each a year for his services. If I were in his position I wouldn't be able to resist maintaining a high level of concern to justify the continued flow of consulting fees. How do you think we can deal with the potential explosion in computer security analysts and consultants that have a vested interest in overstating the problem?

I should say one thing first about Donn and his group at SRI—a lot of the security consulting they're providing is to protect against insider threats, which has been the biggest source of computer abuse over the years, much bigger than outside attack. I would say that the concern at the time the organization was founded, and even the current focus of concern in the organization, is really the insider threat problem. I don't think that's at all being driven by the fear of hackers.

I don't think the motives are to overstate the problem to keep ourselves in business. Because there really is a legitimate concern about what people could do, because we're so aware of the vulnerability. We're so aware of the errors that show up in systems that sometimes can be catastrophic, and we're so aware of the security weaknesses, and we know what somebody could do because of that.

Perhaps the concern about this is based on the fact that there's an awful lot of access taking place, rather than any actual damage being done.

Right, because of the widespread access. Realizing that even if most of those who do that access have no malicious intent, there's a fear that they'll make a mistake and cause damage accidentally. But there's also the fear that all it would take is a couple of people with very malicious intent to be hanging out with them, learning the trade, and then doing something that could be very damaging.

Except for the fact that this kind of work seems to take a fair amount of intellectual horsepower.

Yes, but as it's done more and more it becomes more and more cookbook.

Well, this brings up another point though... In talking to these kids and watching them operate, it seems to me that the most significant skill they develop is what they call "social engineering," the ability to hoodwink officials and employees into giving them information that they shouldn't have. That requires a level of human cunning that's hard to turn into a cookbook recipe. I just don't know how you can give somebody a recipe for brazenness.

Somebody was telling me that some crackers have training sessions to teach each other social engineering.

Also, you can pick up cracking programs on bulletin board systems and turn them on and have your PC crunching away trying to break into systems. And you don't even have to understand how those programs work.

To project ten years into the future, do you think that unauthorized access will be more or less of a problem?

I really don't know, but I'd like to believe it would be less of a problem because system managers would take greater means to prevent it. It will become a routine practice to put reasonable security controls onto the entry into your system.

I tend to agree with you, although it seems like there are more and more people being put in the position of system management who have less and less experience with computers in general. People who are more likely to leave the factory passwords in the system. Do you see any systematic effort being made to train sysops in their responsibilities?

As society progresses the entry requirements to get certain positions increase. I would guess that ten years from now you probably couldn't get a position as a system operator unless you had some experience and training in computer security.

You used to be able to come into the computing profession with a bachelor's in English. You'd just learn it on your own. But not any more. You have to have the right credentials now from school.

So schooling and education can stay ahead of the proliferation of systems?

It's not usually ahead of it, but it starts to catch up. So in the case of people who are managing systems, I would just expect that the background and training in computer security would become a prerequisite. It depends on what the market is, whether or not there are people that have that experience.

What do you think we're doing right in computer security? What do you see that we're doing wrong in computer security? What are established methods of dealing with this problem that are not efficacious?

I think the biggest thing that we're doing wrong is that a lot of systems out there are not using standard practices for preventing very trivial kinds of breakins. That to me is one of the areas where we could be doing a lot better than we're doing. There are standard practices that have been known for over a decade that still aren't being followed.

But like I mentioned earlier, an organization always makes an assessment about where it wants to put its resources, and it may make the assessment that its security risk isn't great enough that it wants to spend the resources on it.

But if it makes that assessment and finds that it's wrong, it wouldn't seem right to blame the people that brought it to its attention, exclusively.

The analogy that people make is what if somebody broke into your house, so you discovered that your lock system wasn't strong enough? Is it your fault for not having invested more money in your lock system?

The problem with that analogy is that there's a general social agreement that breaking into other people's houses is wrong.

Probably not amongst burglars.

Oh, I think burglars know it's wrong. They've just decided that it's not wrong enough.

They know that society says it's wrong, but it's not wrong for them.

Specifically with regard to computer security, do you have a sense that we're going to come up with a general understanding of what's right and wrong, and a more efficient method of enforcing it?

Well, at any given moment of time there's always kind of a consensus around some things and ambiguity around other things. As you reach consensus on things that were once ambiguous, ambiguity arises in some new domains. Everything is evolving. Technology is evolving very fast. The ambiguous areas are always going to grow, probably at a faster rate than the areas where we're reaching consensus.

The way I see it is that we've thrown this technology out there, and as people start using the technology for different things and playing with the technology, their different self-interests come into conflict. The interests of the hackers come into conflict with the interests of business people who are trying to protect what they perceive to be their assets. The interests of the individual come into conflict with the interests of organizations who want to be able to market personal information about people. All these conflicts start emerging—intellectual property rights is a huge area of conflict. As you start trying to understand it all, more conflicts start to emerge in new areas.

Can we keep up with it all? I think we need to find some new ways of being able to deal with these conflicts as they come up and recognize that they are inherent in life. These conflicts are a constituent of life and arise from the fact that the new technology is out there. ■

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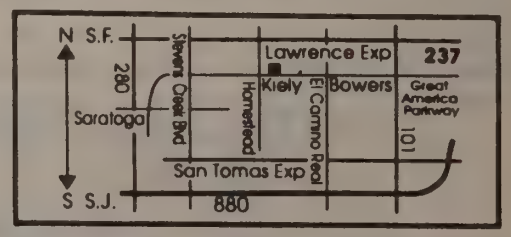

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386 v2.3	141
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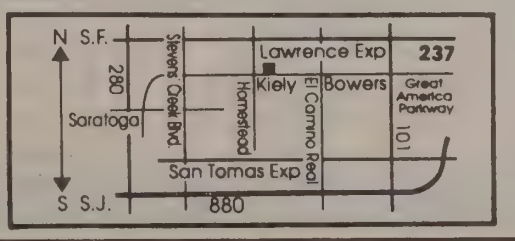

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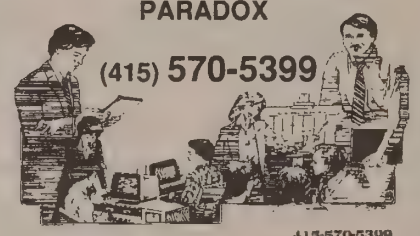

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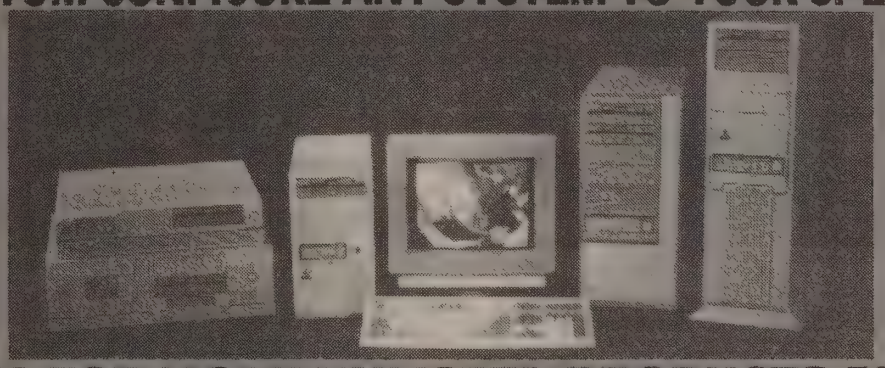

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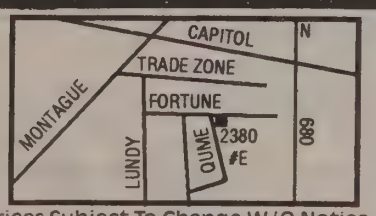

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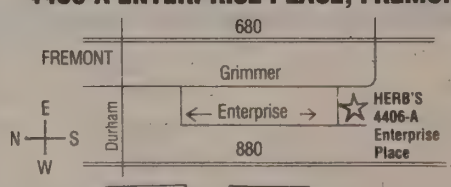

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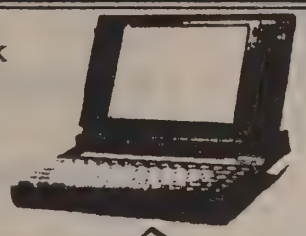

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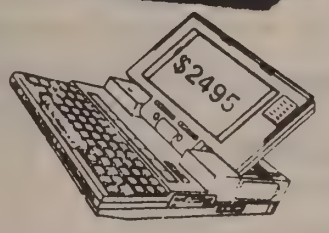

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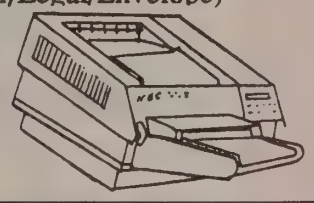

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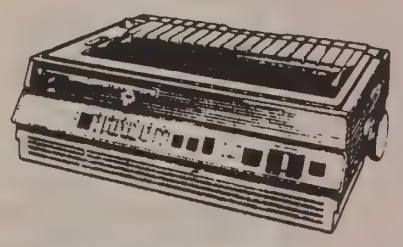

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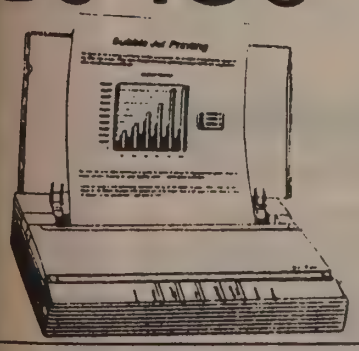

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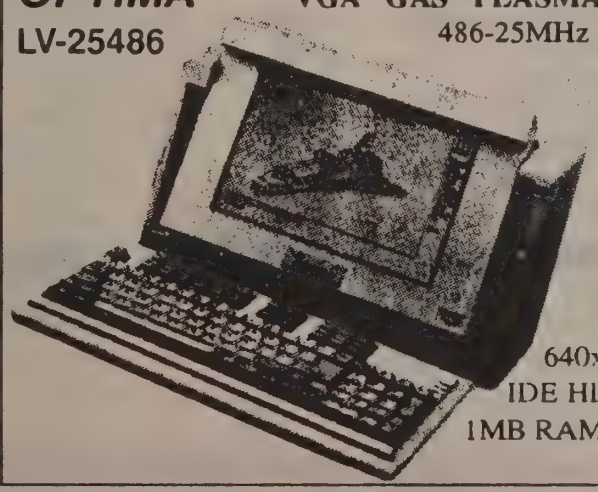

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DESCRIPTION	FOR MODELS	REF. P/N	PRICE
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1MB UPGRADE KIT	II, IICX, IIX, PLUS, SE, SE/30	MO218	$75
2MB UPGRADE KIT	PLUS, SE	MO219	$120
4MB UPGRADE KIT	II, IICX, IIX, PLUS, SE, SE/30	MO2707	$219
1MB UPGRADE KIT	IICI	MO291LL-A	$91
4MB UPGRADE KIT	IICI	MO292LL-A	$240
4MB UPGRADE KIT	LaserWriter II/NTX	M6006	$280
16MB UPGRADE KIT	IICI, IICX	N/A	$1240
4MB UPGRADE KIT	IIFX	MO376LL-A	$270
16MB UPGRADE KIT	IIFX	N/A	$1160
1MB UPGRADE BOARD	MAC PORTABLE	MO248	$254
2MB UPGRADE BOARD	MAC PORTABLE	N/A	$699
3MB UPGRADE BOARD	MAC PORTABLE	N/A	$1140
4MB UPGRADE BOARD	MAC PORTABLE	N/A	$1540
2MB UPGRADE BOARD	MAC SL	N/A	$290
1-3MB EXP BRD	MAC CLASSIC	N/A	$165
AST			
1MB UPGRADE KIT	PREMIUM 386/33	500718-002	$69
4MB UPGRADE KIT	PREMIUM II, 486/25, 386/25	500780-004	$540
1MB UPGRADE KIT	PREMIUM 386C/16	500510-007	$75
4MB UPGRADE KIT	PREM 286, 388C/16	500510-008	$259
1MB UPGRADE KIT	PREMIUM 386	500510-003	$89
2MB UPGRADE KIT	PREMIUM 486	500718-004	$199
AT & T			
2MB MEM EXP KIT	AT&T 6286 WGS	37727	$169
4MB MEM EXP KIT	AT&T 6386, 6386E WGS	37716	$268
2MB MEM EXP KIT	6386/SX, 6386/25 & /33 WGS	37336	$179
COMPAQ			
512K KIT	DESK PRO 286	113012-001	$52
1MB ADD-ON MODULE	386S	113646-001	$95
4MB ADD-ON MODULE	386/20e, 20, 25&25e, 286e	113132-001	$260
4MB ADD-ON MODULE	386S	112534-001	$275
1MB MEMORY EXP. BRD	386S	113633-001	$156
1MB MEMORY EXP. BRD	PORTABLE 386	107651-001	$202
INTFC BRD	PORTABLE 386	107707-001	$98
4MB MEMORY MODULE	SLT/286	110237-001	$890
1MB MEMORY MODULE	SLT/386	118303-001	$209
2MB MEMORY MODULE	SLT/386	118304-001	$359
4MB MEMORY MODULE	SLT/386	118305-001	$741
2MB MEMORY EXP. BRD	386/16	108069/71-001	$429
1MB UPGRADE KIT	386/16	108069-001	$110
1MB UPGRADE KIT	386/16	108071-001	$71
8MB MEMORY EXP. BRD	386/16	108070/72-001	$1350
4MB UPGRADE KIT	386/16	108072-001	$358
INTFC BRD	PORTABLE III	107808-001	$85
2MB UPGRADE KIT	PORTABLE III	107332-001	$220
EXP BRD	PORTABLE III	107811-001	$254
1MB MEMORY BOARD	LTE 286	117081-001	$119
2MB MEMORY BOARD	LTE 286	117081-002	$189
4MB BRD	LTE 286	117081-003	$813
2MB MEMORY MODULE	386S/20, PP386N	118689-001	$149
4MB MEMORY MODULE	386S/20, PP286N, 386N	118690-001	$425
2MB MEMORY MODULE	386/33, 486/25, SYS PRO, 33L	115144-001	$159
8MB MEMORY MODULE	SYS PRO & 486/25	116561-001	$1240
0-16MB EXP BRD	286N, 386N	118700-001	$104
DATA GENERAL			
4MB BOARD	AVIION SERIES	N/A	$1740
DEC			
4MB	DECSTATION 3100	MS01AA	$410
8MB	DECSTATION 5000	MS02AA	$904
32MB	DECSTATION 5000	N/A	$7267
4MB UPGRADE KIT	VAX 3100	MS01-AA	$410
8MB EXP BRD	VAX 3100	MS42-KA	$878
12MB	VAX 3100	N/A	$1333
16MB	VAX 3100	MS42-CA	$1755
20MB	VAX 3100	N/A	$2087
24MB	VAX 3100	N/A	$2542
4MB	VAX 3100	MS42-AA	$598
12MB	VAX 3100	MS42-BA	$1333
8MB	VAX 3000 SER. (MICRO VAX III)	MS650AA, M7621	$1073
16MB	VAX 3000 SER. (MICRO VAX III)	MS650BA, M7622	$1976
32MB	VAX 3000 SER. (MICRO VAX III)	N/A N/A	$3848
8MB	VAX 2000	N/A	$1105
12MB	VAX 2000	MS400CA	$1495
4MB	MICRO VAX II	MS630BB	$735
8MB	MICRO VAX II	MS630CA, M7609AX	$1073
16MB	MICRO VAX II	N/A N/A	$1892
16MB	VAX 8600/8650	MS86CA, LO0225	$3673
1MB	VAX-11/780, 11/785	MS780FX, M8373	$884
4MB	VAX-11/780, 11/785	MS780JX, M8374	$1287
1MB	VAX-11/750, 11/730	MS750CA, M8750	$774
8MB	VAX-11/750	MS750HB	$3900
12MB	VAX-11/750	N/A	$5395

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EPSON			
1MB UPGRADE KIT	IIe, 386/20	A808091	$90
1MB UPGRADE KIT	IIe, 386/20, 386SX, 386/25	A808231	$90
4MB UPGRADE KIT	IIe, 386/20, 386SX, 386/25	N/A	$240
2MB UPGRADE KIT	IIe, 386SX	A808101	$159
2MB UPGRADE BOARD	EPL 6000	1BS401	$172
4MB UPGRADE BOARD	EPL 6000	N/A	$419
2MB UPGRADE KIT	EPL 6000	N/A	$268
EVEREX			
2MB BRD	386 STEP 33	N/A	$195
4MB BRD	486 STEP 25	N/A	$496
2MB UPGRADE KIT	286 STEP 12, 16, 20, 386 STEP IS	N/A	$156
4MB UPGRADE KIT	286 STEP 12, 16, 20, 386 STEP IS	N/A	$268
1MB UPGRADE KIT	386 STEP 16, 20, 25	N/A	$71
2MB UPGRADE KIT	386 STEP 16, 20, 25	N/A	$165
4MB UPGRADE KIT	386 STEP 16, 20, 25	N/A	$294
8MB UPGRADE KIT	386 STEP 16, 20, 25	N/A	$550
HP LASER/VECTRA			
2MB UPGRADE BOARD	LASERJET II, IID	H33444B	$145
4MB UPGRADE BOARD	LASERJET II, IID	H33445B	$238
2MB UPGRADE BOARD	LASERJET III, IIP	H33475B	$145
3MB UPGRADE BOARD	LASERJET III, IIP	H33476B	$192
4MB UPGRADE BOARD	LASERJET III, IIP.	H33477B	$238
2MB UPGRADE KIT	VECTRA QS/16S ES/12PC	D1354A	$139
4MB UPGRADE KIT	VECTRA QS/16S RS/20PC	D1542A	$280
4MB UPGRADE KIT	VECTRA QS/20S RS/25PC	D1642A	$280
1MB UPGRADE KIT	VECTRA 486 PC	D2150A	$85
2MB UPGRADE KIT	VECTRA 386/25	D2381A	$149
4MB UPGRADE KIT	VECTRA 486 PC	D2151A	$420
8MB UPGRADE KIT	VECTRA 486 PC, 386/25	D2125A	$1040
HP/APOLLO			
2MB BOARD	DN3000	N/A	$1166
4MB BOARD	DN3500, 4000, 4500	N/A	$1892
8MB BOARD	DN3500, 4000, 4500	N/A	$3497
HP/3000			
4MB BOARD	6X, 7X	N/A	$4394
8MB BOARD	6X, 7X	N/A	$8450
2MB BOARD	37, Micro 3000XE	N/A	$3380
4MB BOARD	37, Micro 3000XE	N/A	$4563
2MB BOARD	39, 4X, 5X	N/A	$2620
4MB BOARD	39, 4X, 5X	N/A	$5493
HP/9000 WORKSTATION			
1MB UPGRADE	200, 310, 320	N/A	$571
2MB UPGRADE	200, 310, 320	N/A	$1078
4MB UPGRADE	200, 310, 320	N/A	$2177
8MB UPGRADE	200, 310, 320	N/A	$4385
4MB BOARD	318	N/A	$3482
8MB BOARD	318	N/A	$6633
4MB CONTROLLER BOARD	330	N/A	$3651
4MB ADD-ON BOARD	330	N/A	$3245
8MB BOARD	330	N/A	$6633
12MB ADD-ON BOARD	330	N/A	$7301
1MB UPGRADE	332	N/A	$571
4MB UPGRADE	332	N/A	$1395
4MB UPGRADE	340	N/A	$2008
4MB RAM BOARD	345	N/A	$1661
8MB RAM BOARD	345	N/A	$3289
16MB RAM BOARD	345	N/A	$4986
4-12MB BOARD	350	N/A	$4838
4MB BOARD	350	N/A	$3245
12MB BOARD	350	N/A	$7626
4MB UPGRADE	360	N/A	$1850
8MB UPGRADE	360	N/A	$3540
12MB UPGRADE	360	N/A	$5061
IBM			
512K KIT	PS/1	1057035	$91
2MB KIT	PS/1	N/A	$358
2MB MODULE	PS/2, 95XP	6450902	$156
4MB MODULE	PS/2, 95XP	6450128	$397
2MB UPGRADE KIT	30/286, ADT BRD 1497259	30F5360	$134
1MB MEMORY MODULE	70/121, 061, E61, 55SX, 65SX	6450603	$75
2MB MEMORY MODULE	70/A21, A61; B21, B61	6450608	$136
2MB MEMORY BOARD	80/111, 311, 121, 321	6450379	$175
4MB MEMORY BOARD	80/A21, 80/A31	6451060	$449
4MB MEMORY MODULE	55SX, 65SX	34F2933	$354

DESCRIPTION	FOR MODELS	REF. P/N	PRICE
IBM (Continued)			
2-16MB EXP. CARD	30, 50, 50Z, 60, 55SX, 65SX	6450609	$450
4-16MB EXP. CARD	70, 80	34F3011	$730
1MB MEMORY CARD	LASER PRINTER 4019, 4019E	1039136	$125
2MB MEMORY CARD	LASER PRINTER 4019, 4019E	1039137	$169
2MB MEMORY CARD	ADAPTER 6450367	6450372	$384
IBM COMPATIBLE XT & AT			
128K	XT	N/A	$115
256K	XT	N/A	$154
512K	XT	N/A	$156
1MB	XT	N/A	$208
2MB	XT	N/A	$247
512K	AT	N/A	$163
1MB	AT	N/A	$234
2MB	AT	N/A	$284
3MB	AT	N/A	$352
4MB	AT	N/A	$408
8MB	AT	N/A	$750
NEC			
1MB MEMORY EXP. BRD	POWERMATE SX PLUS	APC-H850E	$298
2MB MEMORY EXP. BRD	POWERMATE SX PLUS	N/A	$549
4MB MEMORY EXP. BRD	POWERMATE SX PLUS	APC-H852E	$878
8MB MEMORY EXP. BRD	POWERMATE SX PLUS	N/A	$1528
2-8MB BOARD	POWERMATE SX PLUS	APC-H251E	$488
4-8MB BOARD	POWERMATE SX PLUS	APC-H250E	$631
1MB UPGRADE KIT	PROSPEED 286, SX (NOT THE PLUS)	PC-21-21	$275
2MB UPGRADE KIT	PROSPEED 286	N/A	$420
4MB UPGRADE KIT	PROSPEED 286, SX (NOT THE PLUS)	PC-21-22	$690
2MB UPGRADE KIT	PROSPEED 386	PC-31-21	$449
8MB UPGRADE KIT	PROSPEED 386	PC-31-22	$1599
2MB CPU UPGRADE KIT	POWERMATE SX/20	OP-410-8101	$383
2-8MB EXP. BRD	POWERMATE SX/20	OP-410-8102	$383
SILICON GRAPHICS (IRIS SERIES)			
4MB KIT	PERSONAL 4D/20/25	H4C04A	$699
16MB KIT	PERSONAL 4D/20/25	HU9C16B	$2643
4MB KIT	PRO 4D/40/50/70/80	H4C04B	$699
16MB KIT	CS/12 TURBO 12/16	H49C16B	$2643
8MB KIT	POWER SER. 4D/120/220/ 240/280	H4C08X	$1906
SUN			
4MB OPTION	3/50	N/A	$754
8MB OPTION	3/50	N/A	$1125
4MB OPTION	3/60, 3/80, 4/60, SPRAC	X104C,G,H	$279
4MB OPTION	SPARC SLC	X105Z	$380
16MB OPTION	SPARC 4/60	X116H	$1490
16MB OPTION	4/110	X116D	$1025
16MB	4/330	N/A	$2687
32MB	4/330	N/A	$4580
64MB	4/330	N/A	$7990
8MB OPTION	4/330, 4/370	X108H	$580
4MB OPTION	3/75,110,140,150,160,180	N/A	$1138
8MB OPTION	3/75,110,140,150,160,180	N/A	$1684
12MB OPTION	3/75,110,140,150,160,180	N/A	$2408
16MB OPTION	3/75,110,140,150,160,180	N/A	$3244
20MB OPTION	3/75,110,140,150,160,180	N/A	$4453
24MB OPTION	3/75,110,140,150,160,180	N/A	$5525
8MB OPTION	3/260,280,470,480, 4/260,280	N/A	$4908
16MB OPTION	3/260,280,470,480, 4/260,280	N/A	$6988
32MB OPTION	3/260,280,470,480, 4/260,280	N/A	$11843
TOSHIBA			
1MB MEMORY CARD	T1000/SE, XE	PC14-PA8311U	$259
2MB MEMORY CARD	T1000/SE, XE	PC14-PA8312U	$349
2MB MEMORY CARD	T1200XE	PC13-PA8306U	$206
2MB MEMORY CARD	T1600	PC8-PA8302U	$179
512KB MEMORY KIT	T3100E	PC9-PA8340U	$109
2MB MEMORY KIT	T3100E	PC9-PA8341U	$165
2MB MEMORY CARD	T3100/SX	PC15-PA8308U	$165
4MB MEMORY CARD	T3100/SX	PC15-PA8310U	$499
3MB MEMORY KIT	T3200	PC6-PA7137U	$305
2MB MEMORY KIT	T3200/SX	PC12-PA8307U	$175
4MB MEMORY KIT	T3200/SX	PC12-PA8909U	$499
2MB MEMORY CARD	T5100	PC7-PA8301U	$175
8MB MEMORY KIT	T5200	PC-PA8313U	$1240
2MB MEMORY KIT	T8500	PC10-PA8304U	$175
8MB MEMORY KIT	T8500	PC-PA8313U	$1240
ZENITH			
1MB UPGRADE KIT	Z386/20, 25, 33, 33E	ZA3600ME	$79
2MB UPGRADE KIT	Z386/20, 25, 33	ZA3600MG	$149
4MB UPGRADE KIT	Z386/20, 25, 33, 33E	ZA3800MK	$399
2MB UPGRADE KIT	Z386SX	Z-605-1	$139
1MB EXP. CARD	SUPERSPORT 286, 286E	ZA-180-66	$199
2MB EXP. CARD	SUPERSPORT SX, 286E	ZA-180-64	$358
2MB EXP. CARD	SUPERSPORT SX	ZA-180-86	$358
2MB EXP. CARD	SUPERSPORT SX	ZA-180-87	$425
1MB EXP. BRD	TURBOSPORT 386, 386E	ZA-3034-ME	$249
4MB EXP. BRD	TURBOSPORT 386E	N/A	$599

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Clock/Calendar

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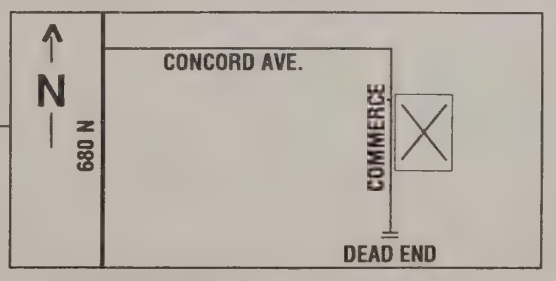

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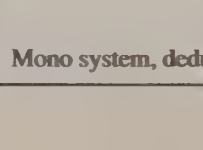

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- 4 MB RAM
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- 1.44 MB 3.5" Drive
- 200 MB 15 ms IDE Drive

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- 16-Bit VGA with 512K
- 14" 1024 x 768 Color Monitor
- 1 Parallel, 2 Serial Ports and 1 Game Port
- 101-Key Keyboard
- MS DOS 3.3 or 4.01

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- External AC Power
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- Internal Sealed Ni-Cd Battery
- External AC Power
- MS DOS 3.3 or 4.01
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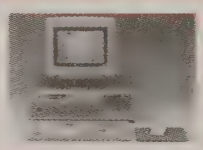

- 64K Cache RAM
- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 200 MB 15 ms IDE Drive
- 16-Bit VGA with 512K
- 14" 1024 x 768 Color Monitor
- 1 Parallel, 2 Serial Ports and 1 Game Port
- 101-Key Keyboard
- MS DOS 3.3 or 4.01

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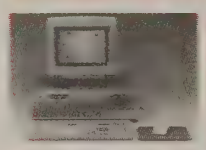

- 4 MB RAM
- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 105 MB IDE Drive
- 16-Bit VGA with 512K
- 14" 1024 x 768 Color Monitor
- 1 Parallel, 2 Serial Ports and 1 Game Port
- 101-Key Keyboard
- MS DOS 3.3 or 4.01

386/25 SVGA	$2495
With 64K Cache	$2695

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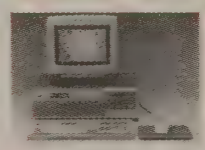

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- 1.2 MB 5.25" Drive
- 1.44 MB 3.5" Drive
- 40 MB IDE Drive
- 16-Bit VGA with 256K
- 14" VGA Color Monitor
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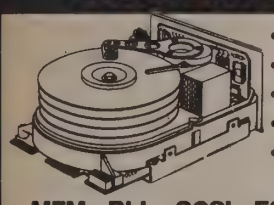

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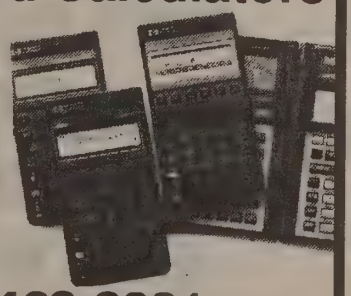

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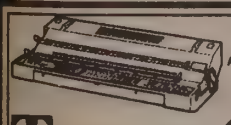

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NEWS & VIEWS

Continued from page 242

take pictures. Even if you're right, I've noticed that you're getting to be more and more of a technology grouch over the years.

DVORAK: Somebody has to do it. The world is plagued by people yelling golly gee-whiz every time they see anything new.

JOHN1: What about the newest craze: virtual reality. Some call it the LSD of the 1990s.

DVORAK: Pretty expensive acid, if you ask me. I can't understand the appeal of a virtual reality when most of the people caught up in it can't deal with true reality. In fact the virtual reality is a low-resolution non-tactile dead fraud of a world, let's face it. It's pathetic that anyone would actually like such a thing! It's no coincidence that this limbo of a reality appeals so much to the '60s-style burnout cases who flashback and begin to freak if they have to deal with real life. In fact you'll never see these people even shopping at Safeway except around midnight when all the weird slouches come out. Having to choose between a Hass and a Fuerte avocado is more than they can handle. Virtual reality is kind of a virtual padded cell for these people.

JOHN1: Don't you think this will be an important form of entertainment in the future? People can visit places they could otherwise not visit.

I think I'm going to stop writing about computers. Now might be a good time. Let's face it, nothing is happening. I'm going to start a new career and begin writing about ballet.

DVORAK: I'm sure the producers of travelogues back in the 1950s said the same things about their films. I think a virtual visit to Paris will be a third-rate useless substitute for a real trip. Who in their right mind buys into this crap?

JOHN1: Perhaps people who are looking for a more perfect world?

DVORAK: No, crackpots who think they are looking for a more perfect world.

JOHN1: Thanks for your time.

DVORAK: Anytime. I like your style. ■

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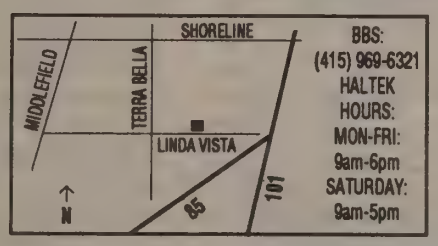

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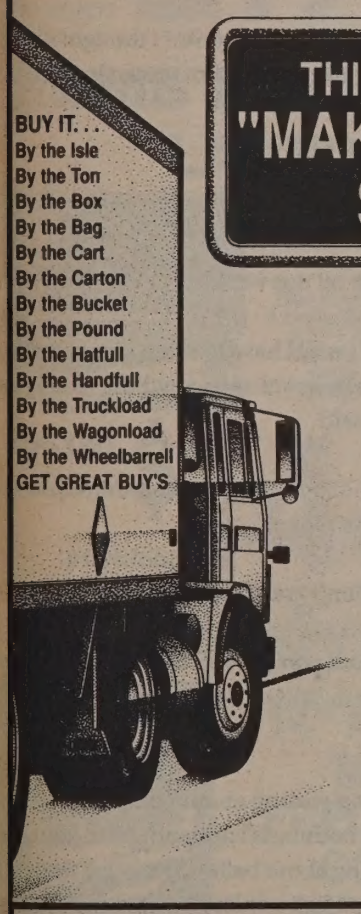

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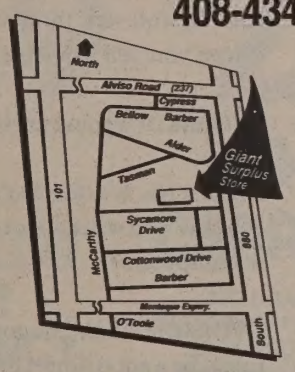

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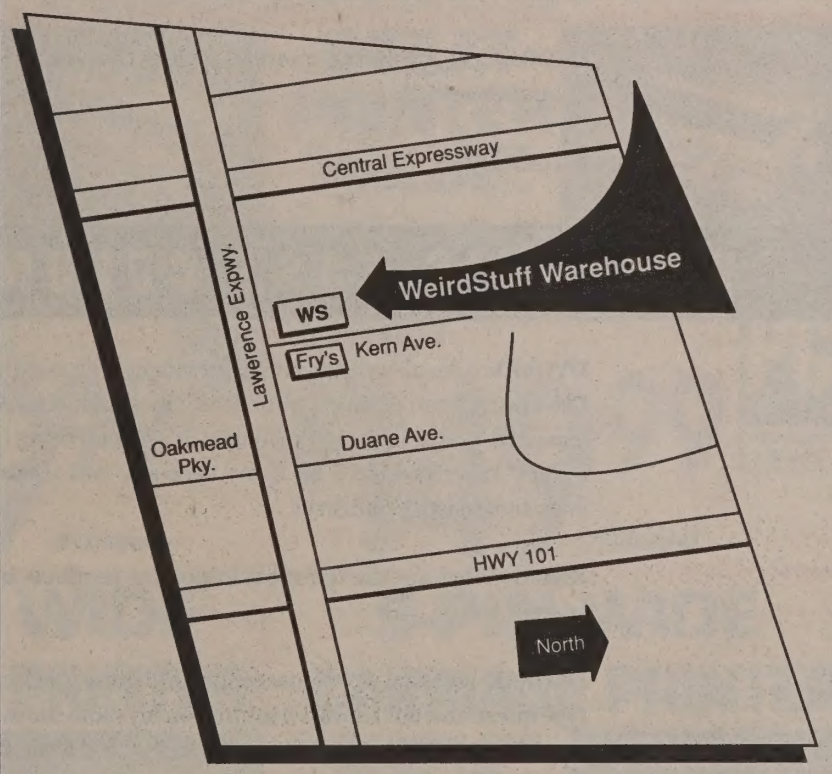

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Interview With Myself

A Sensitive Exposition In Complaining

BY JOHN C. DVORAK

People wonder how I write so many columns. Well, there are two of me, and here I had John number one interview John number two (Dvorak).

JOHN1: So what is the most often-asked question you get during interviews?

DVORAK: That's it! That's the question I get most often asked. Everybody asks me that question.

JOHN1: Well, what about the second most-asked question?

DVORAK: Probably the question, "How did you get started as a computer writer?"

JOHN1: How?

DVORAK'S LAST COLUMN

DVORAK: Like all writers: divine Providence. Or maybe just a fluke. I've always been writing on the side, since high school, but I never expected to specialize so drastically. It's a good thing I picked computers. Where would I be if my specialty was writing about the extrusion plastics industry?

JOHN1: What are the ten most important products in the last ten years?

DVORAK: I see that we're now getting into those mock creative teaser type questions, eh? I think I'll ask that on my radio show. You do know that I'm on KNBR on Saturdays from 2-4. It's a wacky wild show. Nothing like it in the country.

© 1991 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

JOHN1: Yeah, I've heard it, it's great. Back to the questions.

DVORAK: Well, let's see. I'd say the hard disk-based PC XT really kicked things off once the momentum switched away from CP/M and 8-bit machines. Let's not underestimate the power of the laser printer; it's moved more computers than any salesman. The NLQ dot-matrix printer was also important. The Mac should be in there. Maybe I should ask my readers. I can't come up with ten.

JOHN1: Don't you ask readers too much already?

DVORAK: Hey, what can I do? I'm strapped for time. Research takes time. Why re-invent the wheel?

JOHN1: You seem to be burning the candle at both ends.

DVORAK: If Harpo Marx could do it, I can do it. Did you know he played harp by ear?

JOHN1: How many books do you have out?

DVORAK: Well, not counting my imprint line at Osborne/McGraw-Hill, I have four on the market with more to come. They've been well-received.

JOHN1: You're rolling in dough?

DVORAK: Am I supposed to be paid for those books? I thought it was the other way around! No wonder they never sent me an invoice.

JOHN1: Any plans for any new books?

DVORAK: I think I'll do a few more this year.

JOHN1: How do you have time for all this work?

DVORAK: I don't have time. That's why I have to interview myself to get some of this work done. Have you ever seen anything as silly as this? I mean I'm interviewing myself!

JOHN1: You said there were two of you. Why do you think you've driven yourself to such a desperate move?

DVORAK: It's going pretty well. Don't you think?

JOHN1: No. It's dull. Let's talk about computers. This is a computer column. You write about computers. What's happening in the world of computers?

DVORAK: I think I'm going to stop writing about computers. Now might be a good time. Let's face it, nothing is happening. I'm going to start a new career and begin writing about ballet. The latest thing in computers is the Go Computer and nobody knows what to make of it. Then there's that Magic something-or-other. A company developing some sort of cellular walkabout computer.

JOHN1: Sounds nifty. I understand that it allows people to keep in better touch with each other.

DVORAK: Yeah, I heard that. Supposedly you can scratch out a message to your pal Freddy and this thing sends him a fax or something that he receives on his mini-slate. Like wow, man! Hey, who needs this? I think it's time we thought about being less in touch with everyone in the universe. People are getting too plugged in and this isn't going to help things. These devices will become the Nimslo cameras of the 1990s.

JOHN1: Yes, the 3D camera that was going to change the way people

Continued on page 238

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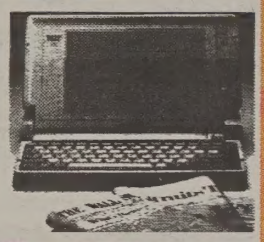

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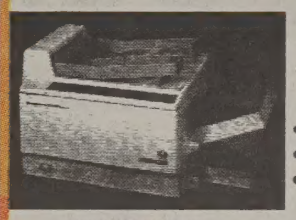

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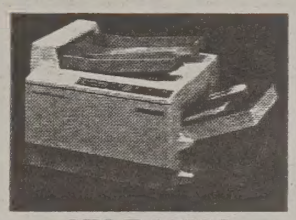

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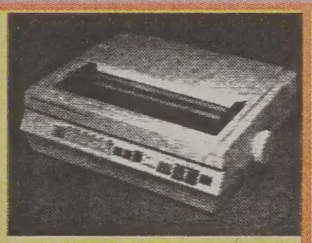

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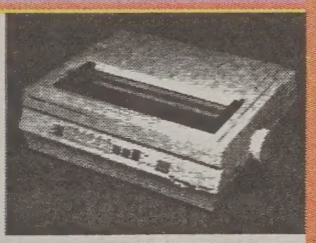

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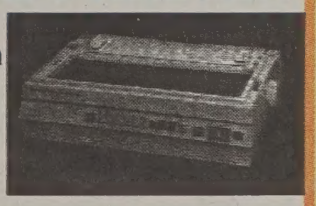

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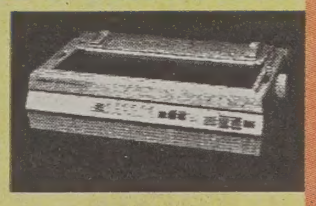

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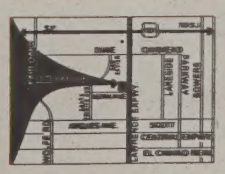

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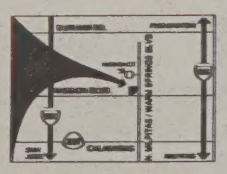

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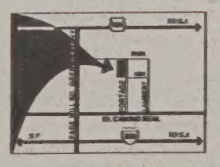

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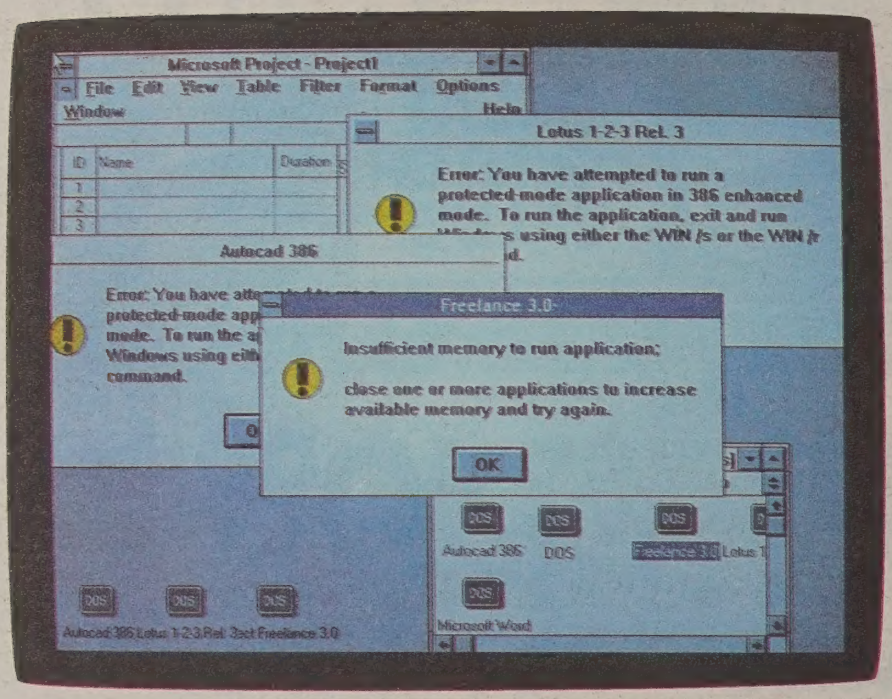
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Quarterdeck

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This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

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